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ABSTRACT

Eleven papers given at a conference on issues in educational services for severely handicapped students are presented. R. Thompson, B. Wilcox, and R. York begin with "The Federal Program for the Severely Handicapped: Historical Perspective, Analysis, and Review." Six program elements in quality education are then addressed in the following papers: "Child Assessment" (O. White); "Curricula for the Severely Handicapped--Components and Evaluation Criteria" (J. Reichle, et al.); "Support Services" (C. Peterson); "Family Involvement in the Educational Process of Severely Handicapped Students--State of the Art and Directions for the Future" (L. Vincent, et al.); "Review and Analysis of Professional Preparation for the Severely Handicapped" (N. Haring); and "Evaluation" (H. Fredericks, et al.). Service delivery issues are examined in the next three papers: "Technology in the Education of the Severely Handicapped" (P. Campbell, W. Bricker, and L. Esposito); "Service Delivery--The Question of Categories" (T. Fox and D. Guess); and "Service Delivery Issues--Integrated Educational Systems" (B. Wilcox and W. Sailor). A final paper focuses on program development ("Model Development Strategies to Improve Educational Services for Severely Handicapped People" by S. Paine and G. Bellamy). (CL)

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B.L.W.
R.T.Y.

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THE FEDERAL PROGAM FOR THE SEVERELY HANDICAPPED
HISTORICAL PERSPECTIVE, ANALYSIS, AND OVERVIEW

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Although severe handicaps have existed as long as mankind has existed, it has been largely within the past ten years that society has gained a real awareness of the basic human rights and needs of severely handicapped people. A national commitment to support these rights and meet these needs began to develop during the past decade and is still evolving.

HISTORICAL PERSPECTIVE

Initiated by unselfish individual efforts, this commitment was also joined by civic, religious, and community groups whose combined work has generated a concern that is truly national in scope. A manifestation of this concern was the enactment in the recent past of substantive educational laws and other legislation providing assistance to this population. When the Bureau of Education for the Handicapped (now the Office of Special Education) was established in January 1966, a national agency assumed an advocacy role in behalf of this population, with responsibilities for the development and evaluation of programs addressing the variety and complexity of their needs. It was in keeping with the Bureau's national directive to provide services to the handicapped, and with its assigned responsibility for administration of special federal programs designed to meet the needs of this group, that its leadership in education of the severely handicapped emerged. An April 17, 1973, memorandum from Robert B. Herman, Acting Deputy Associate Commissioner of Education, announced the Bureau's thrust into this challenging field (Herman, 1973). This memo referred to adoption of a new Bureau-wide objective in the 1974-1978 Five Year Plan: to enable the most severely handicapped children and youth to become as independent as possible, thereby reducing their requirements for institutional care and providing opportunity for self-development. The memo also announced that:

> A task force has been appointed to develop 1974 objectives for achieving the long-range goal and to outline a BEH operating plan for 1974 which includes appropriate milestones. Task force members are: Paul Thompson, chairman; Bob Dantona, Bill Johnston, Larry Lieberman, Herman Saettler, Ed Sontag, and Ernie Hairston. (p. 1)

The task force met officially for the first time on May 1, 1973, to review its objectives and plan for their accomplishment. A position paper developed by the task force and released on July 31, 1974, made painfully clear the educational condition of severely handicapped individuals at that time, e.g.:

> We estimate that nearly one million severely handicapped children and youth are totally excluded from the educational system of our nation. At least 300,000 others are not receiving adequate services. One of the principal causes for this lack of service benefits to the handicapped appears to be the lack of appropriate legislation making educational and related services to such persons mandatory or at least highly suggested. Currently, only five states (Maryland, Missouri, Montana, North Carolina, and Tennessee) have mandated service to severely handicapped children and youth. An additional 23 states have adopted legislation which implies support for such services, while 13 states have legislation which implies lack of support, and six states do not allow for state reimbursement to such efforts (Alabama, Connecticut, Delaware, Florida, New Jersey, New York -- with the exception of New York City itself). The states of Louisiana, Mississippi, and Pennsylvania have no mandatory special education laws.
>
> The principal problems delimiting the delivery of effective educational/training services to severely handicapped children and youth, in those areas where such services are mandated or supported, include: (a) extensive deficiencies in personnel with expertise and experience; (b) lack of adequate functional facilities; (c) general void of appropriate curricula, methodologies, and education/ training programs; (c) scarcity of specialized materials and equipment; (e) limited child and youth identification, diagnostic, prescriptive, and placement services; and (f) a general apathy or lack of concern for the needs of such persons, as well as the near nonexistence of advocate groups organized and

> functioning on their behalf. (BEH Task Force on Severely Handicapped Children, 1974, p. 4)

This paper further indicated that, despite programs administered under such legislation as Public Law 89-313 (an amendment to Title I of the Elementary and Secondary Education Act which provides services to children in state-operated and state-supported educational programs) and Part B, Education of the Handicapped Act (which provides services to children in local school districts), many thousands of severely handicapped children were being denied their rightful educational privileges. The specific strategy proposed for implementation by BEH during fiscal year 1975 as an initial step toward meeting the educational needs of these children was to develop and refine a national compact between BEH and ten selected states on educational and training for the severely handicapped. This action envisioned active dialogue with the selected states to develop baseline data to be used tentatively in a preliminary assessment of the scope, quality, and breadth of viable planning for the severely handicapped. The task force was given the responsibility of initiating discussion with various state officials and implementing the strategy.

Early in the work of the task force, estimates of the number and types of severely handicapped children were developed on the basis of information provided to the Bureau by states in their Annual Projected Activities Documents (OE 9016) mandated by the Education of the Handicapped Act (Public Law 91-230). These data reported the existence of approximately 460,000 severely and profoundly mentally retarded, 5,064 deaf-blind, 40,900 multiply handicapped, and 900,000 seriously emotionally disturbed -- a total of 1,405,964 children aged 0 to 19 years. It was estimated that, of these children, only 352,142 were receiving some services and among these services were many deemed inadequate in relation to real needs. Even more serious, the remaining 1,053,822 were reported unserved.

Another early endeavor of the task force was the development of a working definition of severely handicapped children, a definition that would more sharply focus Bureau efforts on those minimally functioning children and youth who appeared to be most often neglected in the development of educational programs. After considerable deliberation, the task force proposed a potpourri definition which included references to service needs, to traditional categories of handicapping conditions, and to behavior characteristics. This definition was later to appear as part of the Program Regulations:

"Severely handicapped children" are those who because of the intensity of their physical, mental, or emotional problems, or a combination of such problems, need educational, social, psychological, and medical services beyond those which are traditionally offered by regular and special educational programs, in order to maximize their full potential for useful and meaningful participation in society and for self-fulfillment.

(a) The term includes those children who are classified as seriously emotionally disturbed (including children who are schizophrenic or autistic), profoundly and severely mentally retarded, and those with two or more serious handicapping conditions, such as the mentally retarded blind and the cerebral palsied deaf.

(b) "Severely handicapped children" (1) may possess severe language and/or perceptual-cognitive deprivations, and evidence abnormal behaviors such as: (i) failure to respond to pronounced social stimuli, (ii) self-mutilation, (iii) self-stimulation, (iv) manifestation of intense and prolonged temper tantrums, and (v) the absence of rudimentary forms of verbal control, and (2) may also have extremely fragile physiological conditions. (21 U.S. Code 1401 [7]; 45 Code of Federal Regulations 121.1)

The task force next set about developing a Request for Proposal (RFP) which would provide funding for demonstrations of services to the severely handicapped. By October 3, 1973, Draft No. 1 of the proposed RFP had been developed and, in January 1974, it was issued in final form and officially announced to the field. This Request for Proposal was followed in the same month with development of a second RFP concentrating on the provision of educational services to the homebound severely handicapped child/youth through telecommunications. Funding for the first of these procurements (totalling $3.8 million) came from monies assigned to the Regional Resource Centers Program and the Handicapped Children's Early Education Program. Funding for the telecommunications models ($2.247 million) came entirely from the Media Services and Captioned Film Program.

Request for Proposal 74-5, "Telecommunications for Severely Handicapped Children and Youth," sought to explore the effectiveness of modern telecommunications technology in the provision of education and training services to those severely handicapped children and youth who were homebound due to restricted mobility or to other aspects of social performance or physical involvement. In response to this RFP, nineteen applications were received and five were selected and funded as of July 1, 1974. Included in these early projects were:

- Videotaped presentations for assisting parents of severely handicapped infants and small children;
- Counseling and instructional packets for parents living in rural areas, distant from project headquarters, with telephone service available at no expense to parents from the home to the master teacher;
- Closed-circuit television programs for children of slightly higher functioning who become captivated with the teaching antics of puppets;
- Stimulation programs for severely handicapped children and infants in Appalachia; and
- Closed-circuit, computerized home instruction for severely emotionally disturbed children.

"Programs for Severely Handicapped Children and Youth," RFP 74-10, designated funding for projects which would provide, in conjunction with relevant public and private agencies and organizations within a state, (a) a plan for comprehensive services designed to meet identified developmental needs of severely handicapped children and youth; (b) a model demonstration program providing direct educational and/or training services for these children and youth which could ultimately be replicated statewide and throughout the nation; and (c) a dissemination strategy whereby information about exemplary program activities or elements would be made widely known to both professional and nonprofessional personnel working with or interested in the education and training of severely handicapped children and youth. Of the forty-two proposals that responded to this RFP, ten were selected for funding, beginning on July 1, 1974.

Soon after the announcement of these RFP's, U.S. Commissioner of Education, T. H. Bell, prepared a memorandum to Chief State School Officers indicating the priority status assigned by the U.S. Office of Education to the initiation, expansion, and improvement of training and educational services for severely handicapped children and youth. In the memorandum, Dr. Bell indicated that he had asked the Bureau of Education for the Handicapped to develop management objectives in this area so that he might be personally informed of the progress being achieved nationally toward provision of adequate and appropriate services to this population.

He also articulated the objectives against which the Office would be assessing progress in this area of national concern:

> 1. Reaffirmation, as evidenced by enactment of permissive and mandatory national and state legislative action supported by the appropriation of adequate funding for service implementation, of the right of all handicapped, including the severely handicapped, to a tax-supported and appropriate public education.
> 2. Establishment of effective programs for identification, testing, assessment, and appropriate placement of such children. Such activities shall be free of racial, cultural, sex, or other discriminatory practices.
> 3. Establishment of appropriate and effective educational environments, i.e., neighborhood schools, hospital schools, and classes and intensive educational care units for severely handicapped children.
> 4. Provision for and encouragement of participation of parents, families, handicapped youth and adults, as well as other citizens from the community at large, in activities supportive to the central thrust of educational services to severely handicapped children and youth. (Bell, 1974, pp. 1-2)

Dr. Bell assigned the Bureau the responsibility of monitoring progress in this national initiative and invited participation from the states in a coordinated effort. The content of this historic memorandum was communicated to states at several national and regional conferences.

Having stimulated some national response through the issuance of RFP's 74-5 and 74-10 and the subsequent award of fifteen new projects, task force representation was invited to the Rocky Mountain Regional Resource Center's topical conference, "The Severely, Multiply Handicapped -- What Are the Issues?". The conference convened in Salt Lake City, with addresses by Dr. Edwin W. Martin, representing the Bureau of Education for the Handicapped, and Paul Thompson speaking on behalf of the task force in particular. Participants at this early conference included a number of professionals who were soon to become increasingly identified nationally in the field of the severely handicapped: Thomas Bellamy, University of Oregon; Albert Berkowitz, Massachusetts Department of Mental Health; Lou Brown, University of Wisconsin-Madison; James Crosson, Northwest Regional Resource Center; Elsie Helsel, United Cerebral Palsy Association; Fred

Krause, President's Committee on Mental Retardation; Francis Lynch, U.S. Division of Developmental Disabilities: Philip Roos, National Association for Retarded Citizens; Richard Scherr, Lancaster-Lebanon Intermediate Unit of Lancaster, Pennsylvania; and Bob York, University of Wisconsin-Madison.

The next step was taken by the National Association of State Directors of Special Education, Inc., which sponsored (with a grant from the Bureau of Education for the Handicapped) a training session on "Strategies of Planning for the Severely, Multiply Handicapped," at Tampa, Florida, July 8-9, 1974. Representatives from 29 states, the Virgin Islands, and Washington, D.C., were in attendance to plan steps for implementing the strategies discussed at the Salt Lake City meeting. Paul Thompson and Ed Wilson represented the Bureau at this event, taking the opportunity to explain further the Bureau's new national emphasis on educational needs of the severely handicapped.

In October 1974, the Bureau gave organizational status to its efforts for the severely handicapped by announcing the initiative for their education as an official program of the agency and assigning its administration to the newly created Special Services Branch in the Division of Assistance to States. This designation ascribed to the program the importance of other federal activities serving the severely handicapped in state operated and supported programs under Public Law 89-313, and to locally administered programs receiving funding under the Education of the Handicapped Act, Part B.

That interest in severely handicapped children was growing nationally became evident in January 1975 when the Bureau invited the submission of proposals in response to six RFP's (75-14 through 75-19) designed to direct attention to specific types of severely handicapped children. More than 1,200 requests for copies of the RFP's were received, leading to the submission of 69 formal proposals. Their collective focus was on specialized services for the severely or multiply handicapped child with auditory, visual, orthopedic, or emotional impairment as one of the primary handicapping conditions, and on the profoundly retarded child or youth. Seven new contracts were awarded.

Requests for Proposals issued during the next two years continued to direct attention to the learning needs of severely handicapped children for whom primary handicapping conditions had been identified in the fiscal 1975 procurement requests. In continuing the focus on such children, the Bureau was not seeking to further perpetuate the concept of categorization among the severely handicapped but, rather, through provision of federal assistance, to encourage the active participation of many ongoing service programs throughout the nation -- both residential and public school based -- to conceptualize and develop exemplary "model" approaches to the education of their children. During these years, contracts were awarded to three model efforts stressing services to the auditorially impaired (severely handicapped), to seven projects addressing the education of emotionally disturbed children, to six whose concerns were with orthopedic impairment, to five in the area of visual handicaps, and to twelve serving the severely/profoundly mentally retarded.

Several significant changes were incorporated into the program in fiscal 1978. First, it was moved to the Special Needs Section in the Division of Innovation and Development. At that point, the affiliation with Innovation and Development more accurately reflected the purpose of the model program design and development with which the program was soon to become more identified. The model program concept was to become a strategy intended to change both service delivery and knowledge in the field.

Second, the Requests for Proposals were dramatically changed -- from the reinforcement of service programs to the engineering of innovative, forward-reaching efforts to demonstrate new, more effective methods of reaching the severely handicapped. The essence of this new thrust was incorporated in RFP's 78-9 and 78-10, under which six awards were made.

A third major change, in the current fiscal year, was the initiation of a federal effort to support innovative educational programs for the deaf-blind. Since 1969, the Bureau had funded the Centers and Services Program for Deaf-Blind Children. This educational support program, begun in 1969 with a $1 million funding base, had by this time increased to a $16 million federal effort to serve the deaf-blind. The designation by the Bureau of set-aside monies for this program, for purposes of launching a new plan to support innovation in education for this population, was a major endorsement of the model-building concept.

The distinguishing element of the federal Program for the Severely Handicapped, as it emerged with the RFP's initiated in fiscal 1979 and 1980, was the concerted attention to large, systematic issues related to the education of the severely handicapped. Of particular concern had been the problem of facilitating the integration of severely handicapped students into attendance centers which also serve non-handicapped students, of deinstitutionalizing these children into least restrictive environments, and of promoting their acceptance into normalized community settings. An additional area of attention was the development of a procurement request to fund model educational projects serving the autistic-like child.

Still another set of endeavors bridged the years from 1974 to 1980: the annual project directors' meetings, the development of conferences, and the subsequent publication of conference reports and other documents. The annual meeting of project directors was a mechanism utilized early in the history of this program for the sharing of information between projects, and also for the instruction of project personnel in contracts management and procedures. The first such session, called "Interchange Session I," was convened in Kansas City, Missouri, November 11 and 12, 1975 (preceding the first meeting of the American Association for the Education of the Severely/Profoundly Handicapped). Other such meetings followed: October 12 and 13, 1976, in Kansas City, Missouri (again preceding the annual meeting of AAESPH); August 11 and 12, 1977, in Washington, D.C. (following the topical conference, "Developing Effective Individualized Education Programs for Severely Handicapped Children and Youth"); and others on October 4 through 6, 1978, in Washington, D.C., and November 25 through 28, 1979, also in Washington.

Conference documents and other publications were limited in numbers but significant in content. In cooperation with the Coordinating Office of the Regional Resource Centers, the document Early Childhood Programs for the Severely Handicapped (Coordinating Office for the Regional Resource Centers, 1976) was produced in April 1976. This publication contained abstracts and specific data on instruments and methodology for assessment, encompassing identification and screening; diagnostic, prescriptive, and child-progress evaluation; data on inservice training programs; and a section on books, articles, and other publications generated by the individual projects. Eight of the first fifteen projects funded for severely handicapped children under this program addressed, at least in part, services to preschool severely handicapped children and were included in the publication.

A second major publication, Developing Effective Individualized Education Programs for Severely Handicapped Children and Youth (Haring, 1977) was produced as a report of the special topical conference addressing this theme in August 1977. This document consisted of chapters by twelve prominent educators and researchers in the field of education for the severely handicapped.

The National Conference on Innovation in Education for Deaf-Blind Children and Youth in December 1978 also provided substance for conference proceedings (National Conference on Innovation in Education for Deaf-Blind Children and Youth, 1978). Authors of articles appearing in this publication came from the fields of education for the severely handicapped and education of the deaf-blind. Most recently, the Conference on Critical Issues in Educating Autistic Children and Youth, held on February 6, 7, and 8, 1980, generated a contribution to literature in the field of autism (Wilcox and Thompson, 1980).

ANALYSIS

Between 1974 and 1978, the Special Needs Section issued 24 separate RFP's (see Table 1). Six additional RFP's issued in 1979, but encumbered by a set-aside provision from the Department of Labor, were reissued in 1980. At the close of 1979, a total of 64 projects had been funded in 32 states (see Figure 1 and Appendix A).

The activity of the Office of Special Education's Program for Severely Handicapped Children and Youth is probably best reflected in the nature of the RFP's over time. Federal level policy changes, the increasing capabilities of the field, and the relative importance of various problems at different points in time are all represented in the RFP workscopes. In retrospect, both the focus and the standards of the procurements have changed dramatically.

Change in Focus

The goal of the early procurements (1974-1977) was the provision of basic educational services to severely handicapped children and youth. Contractors were funded to provide direct services and to collect and disseminate information regarding the learning potential of these children, as well as to disseminate effective teaching techniques and procedures. The Special Needs Section used the powers of a contract program to bring attention to a group of students who had long been ignored by the public schools and the educational system in general. The request made of contractors was, in a very literal sense, to show and tell: show that severely handicapped students could learn and tell that to others. With the passage of Public Law 94-142 and the guarantees of a free appropriate public education to all children, regardless of their degree of handicap, it was neither necessary nor appropriate for the Special Needs Section to continue the basic education focus. The comprehensive services identified in early RFP's were, as of October 1, 1978, the responsibility of state and local

Table 1
History of Procurements Related To Severely Handicapped Children and Youth

RFP	TITLE
74-5	Telecommunications for severely handicapped children and youth who are homebound.
74-10	Programs for severely handicapped children and youth.
75-14	Programs for severely handicapped children and youth with auditory impairment as one of their primary handicapping conditions.
75-15	Programs for severely handicapped children and youth with emotional disturbance as one of their primary handicapping conditions.
75-16	Programs for severely handicapped children and youth with orthopedic impairment as one of their primary handicapping conditions.
75-17	Programs for severely handicapped children and youth with visual impairment as one of their primary handicapping conditions.
75-18	Programs for profoundly/severely retarded children - birth through early childhood.
75-19	Programs for profoundly/severely retarded youth.
76-17	Programs for severely handicapped children and youth with auditory impairment as one of the principle handicapping conditions.
76-18	Programs for severely handicapped children and youth with emotional disturbance as one of their principle handicapping conditions.
76-19	Program for severely handicapped children and youth with orthopedic impairment as one of their principle handicapping conditions.
76-20	Programs for severely handicapped children and youth with visual impairment as one of their principle handicapping conditions.
76-21	Programs for severely/profoundly retarded children birth through early childhood.
76-22	Program for severely/profoundly retarded youth.
77-10	Program for severely, multiply handicapped children and youth with auditory impairment as one of their primary handicapping conditions.
77-11	Programs for severely, multiply handicapped children and youth with emotional disturbance as one of their primary handicapping conditions.
77-12	Programs for severely, multiply handicapped children and youth with orthopedic impairment as one of their primary handicapping conditions.
77-13	Programs for severely, multiply handicapped children and youth with visual impairment as one of their primary handicapping conditions.
77-14	Programs for severely/profoundly mentally retarded children and youth.

Table 1 Continued

77-20	Programs for severely multiply handicapped children and youth: Demonstration-outreach phase.
78-9	Projects for severely handicapped youth.
78-10	Projects for severely handicapped children and youth: Demonstration-outreach phase.
78-30	Model projects for deaf-blind youth.
78-31	Model projects for deaf-blind children.
79-34	Innovative vocational models for deaf-blind youth.
79-35	Innovative educational practices for deaf-blind children and youth.
79-42	Integrated service delivery models for severely handicapped children and youth.
79-43	Deinstitutionalization models for severely handicapped children and youth.
79-44	Deinstitutionalization/integration models for deaf-blind children and youth.
79-50	Model educational services for autistic children and youth.
80-4	Innovative vocational models for deaf-blind youth.
80-5	Integrated educational service delivery models for deaf-blind children and youth.
80-6	Deinstitutionalization models for deaf-blind youth.
80-7	Innovative educational practices for deaf-blind youth.
80-8	Model programs for autistic children and youth.
80-12	Implementation of quality educational service systems for severely handicapped children and youth.
80-13	Evaluation of the impact of integrated educational services for severely handicapped children and youth.
80-50	Integrated service delivery models for severely handicapped children and youth.
80-51	Deinstitutionalization models for severely handicapped children and youth.
80-97	Model educational programs for autistic children and youth (RFP 80-8, reissued).

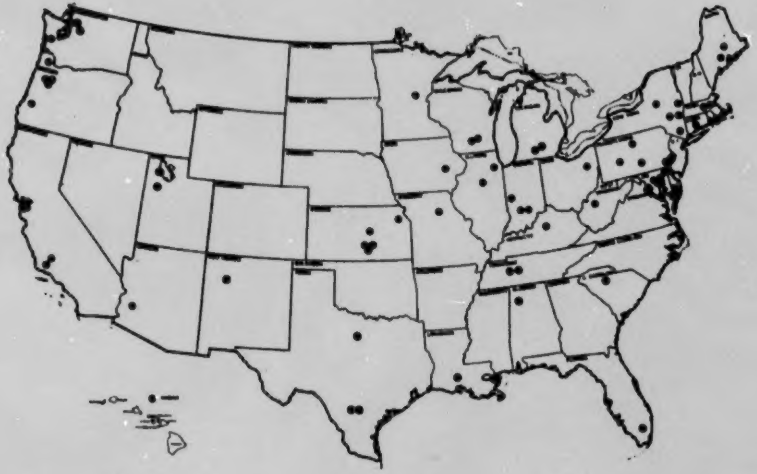

FIGURE 1.

Distribution of programs for the severely handicapped funded in fiscal 1979.

education agencies. Beginning with 1978, the RFP's for Model Programs for Severely Handicapped Children and Youth began to focus on quality educational services. Now that access to an education was mandated, the discretionary funds of the Special Needs Section could be directed to the design of innovative educational practices. Such practices would have the effect of stretching best practice efforts to improve the impact of the newly mandated educational services. An extension of the "innovative practices" focus was obvious in the procurements for 1979. These RFP's (for integrated educational services, for deinstitutionalization models, and for comprehensive classroom models to serve students labeled "autistic") demanded that project activities extend beyond design and implementation of isolated techniques to address larger systems issues in the provision of services to the severely handicapped. In the relatively brief period of six years, RFP's have moved from isolated demonstrations of student learning -- to concern for innovative practices -- to procurements that focus on the design of overall systems change.

Correlated with this shift has been the increasing content focus of the RFP's. Early procurements supported the broad curriculum focus that accompanied the notion of comprehensive services. Later RFP's (1978 and 1979) reflected judicious use of the Special Needs Section's contract program and specifically charged offerors with developing materials to teach communication, social and vocational skills, domestic living, or leisure/recreational skills. These content domains are those that had been relatively ignored by the earlier broad band efforts to develop appropriate educational programs.

Two additional curriculum features have accompanied the trend to target specific curriculum domains. One is the stipulation that the curriculum be functional; that is, that the curriculum deal with those behaviors that occur frequently and are important in students' natural environments. The second is the emphasis on age-appropriate tasks and materials. While early RFP's might call for general training in the basic cognitive and affective domains, essential motoric and communicative skills, and social adjustment, more recent procurements would request vocational training to reflect "specific work demands" in the most integrated vocational placement or a curriculum which trained social skills necessary to interact with peers in integrated educational settings.

The earlier RFP's (1975-1977) focused on categorical subgroups (retarded, visually impaired, orthopedically impaired, and so on) of the larger severely handicapped population. The categorical approach reflected less the Bureau's eclectic definition than the organization of regular special education. More recent RFP's (1978 and 1979) were, by contrast, basically noncategorical, inviting offerors to approach the design of innovative practices for severely handicapped students in general. Against the general trend to noncategorical procurements, the Special Needs Section did target two specific subpopulations: the deaf-blind and the autistic. The former were the focus of separate procurements because of funding requirements: the contracts were supported by the Centers and Services Program for Deaf-Blind Children and Youth. Despite the nominal separation, the titles and content of the RFP's for the deaf-blind were identical in content and spirit to those designed to benefit severely handicapped children and youth in general. A separate procurement for autistic children and youth was designed because of the federal realization that classroom service delivery models for educating autistic students were not generally available in regular public school programs. The short-term use of categorical funding was, in effect, intended to develop public school programs that would facilitate the eventual integration of students with autism into the schools and the community. Thus, the long-range goal of these categorical RFP's was the design of noncategorical services.

Dramatic changes are apparent in the Special Needs Section's procurements over the last six years. In large part, these changes reflect (a) an increased experience in the field in educating students with severe handicapping conditions, (b) increasingly sophisticated technology, and (c) the support of demonstrations of values inherent in Public Law 94-142. These changes in program focus have been matched by changes in standards for funded projects.

Changes in Standards

From inception to the present day, the federal Program for Severely Handicapped Children and Youth has developed increasingly rigorous project standards. In the first RFP's, offerors were guided only by the general mission that all severely handicapped children and youth should benefit from a full range of comprehensive services to assure their appropriate growth and development. The means by which one was to evaluate the existence of this "benefit" were similarly vague. Recent RFP's, by contrast, specifically direct offerors to explain not only the mechanics of project activity but also how those activities relate to a set of quality standards that include integration, interagency cooperation and coordination, applied research, and the demands of adult independent functioning. Value statements that were initially vague became quite explicit as the model programs developed. (See Appendix A for a review of projects.)

Perhaps nowhere is the increased demand for sophistication more apparent than in the evaluation sections of the RFP's. Early offerors were directed to employ standardized test measures to evaluate the impact of project activities on the children served. Later procurements requested offerors to delineate instruments, the evaluation schedule, and procedures for data analysis. The most recent RFP's go further still in setting evaluation standards. Respondents must describe instrumentation for specific evaluation questions posed in the workscope, evaluate each project component, provide cost-effectiveness data, utilize design procedures that permit the attribution of change to project activity, and evaluate project impact on the overall service system -- not only on the children served.

While dissemination has been a component of all Special Needs Section procurements, there has been a subtle shift in the standards for project dissemination. This shift supports the effort to engage in true model development, rather than good services alone. The early directive to "show and tell" included dissemination as a major component throughout the life of the project. Recent RFP's, however, limit broad dissemination efforts to the final funding year after project components and their evaluation have been carefully reviewed.

THE FUTURE

Historians tell us that, to predict where we are going, it is useful to know where we have been. Regrettably, but understandably, funding programs are ever looking into the future, drawing next year's plans and programs, often without careful consideration of the nature and impact of their current effort. The need for pause and reflection is especially great when there is rapid growth and a growing sophistication in the program field. The circumstances in which original plans were made and directions set for programs for severely handicapped children and youth have changed dramatically in the past six years (see, for example, Sailor, Wilcox, and Brown, 1980). In light of those changes -- many of which were effected by the Special Needs Section itself -- it seemed appropriate to review the program history before charting the course for a new decade.

Toward this end, on November 1 and 2, 1979, in Reston, Virginia, the Bureau of Education for the Handicapped and International Business Services, Inc., sponsored an invisible college to address the state of the art in educational services for severely handicapped children and youth. The conference, initiated by the Special Needs Section, had three interrelated goals. The first was to review projects funded by the Special Needs Section since its inception. The second was to use this history to define current "best practice" in educational services to severely handicapped students. The third and final goal was to use past and present practice to anticipate future program issues and set new directions. In short, the conference was to be both retrospective and prospective.

This volume represents the compendium of papers presented at that conference. Topics were chosen to reflect the full range of elements and issues in the design and delivery of educational services to severely handicapped children and youth. Conference presenters and participants were selected so that each had special expertise in one of the designated areas. Prior to the conference, authors were forwarded project reports from a sample of the Special Needs Section's demonstration projects, each author receiving a different set of materials. Because of the interest in a comprehensive and systematic appraisal of both the projects and the general state of the art related to each issue, authors were requested to structure their presentations around a generic outline. The analysis section of these chapters provides an introduction and the authors' general conceptualization of their topics. In the section on appraisal, authors establish their quality standards for the particular topic and evaluate the sample project materials against those quality features. From there, the chapters move to describe the state of the art and extend their discussions beyond the stimulus materials provided for review. The summary reviews trends, makes general recommendations, and identifies directions for future work.

As a whole, this volume has realized the goals of the Reston conference. It represents one of the rare instances of voluntary self-review by a federal program. Each chapter establishes current best practice standards. As a whole, they present a clear definition of quality services to severely handicapped students. In a sense, these materials provide a general prescription for a truly exemplary program. The last goal of the conference -- to identify both promising new directions and issues in need of still more attention -- is accomplished by the chapters individually and, in summary, in the final chapter.

It is our hope that these papers will give the reader a sense of history and a glimpse into the future. More important, however, we hope that they present the standards against which one might judge the programs of today.

APPENDIX A

PROGRAMS FOR SEVERELY HANDICAPPED CHILDREN AND YOUTH

RFP 74-6, "Telecommunications for Severely Handicapped Children and Youth"

Robert Carrie, Project Director Project FEATT Purdue University Achievement Center for Children West Lafayett, Indiana	An instructional program for parents of severely/handicapped, homebound children, utilizing closed circuit television programming. Produced 60 videotapes addressing critical learning needs of preschool severely handicapped children aged 0-3.
James Tawney, Project Director University of Kentucky Research Foundation Lexington, Kentucky	An electronically programmed environment for education of preschool, severely/profoundly mentally retarded children aged 0-21 through the use of a telephonic linkage system in remote Appalachia.
James Marrilo, Project Director Regents of the University of the State of New York N.Y. State Dept. of Education Albany, New York	A computer-based program of individual instruction via closed circuit television which utilized commercially available software, for severely handicapped children aged 4-21 whose physical impairments were so severe that they were unable to attend public schools.
Paul Stallino, Project Director Research Foundation City University of New York New York, New York	An interactive response system employing cable television coupled with video-taped, computerized educational programming featuring puppet characters, for instructing severely emotionally disturbed children aged 3-21.
Alan Hofmeister, Project Director Exceptional Child Center Utah State University Logan, Utah	A training program utilizing skill area teaching packets and a telephonic communications system to train parents in rural, remote areas to educate their severely handicapped, homebound children aged 3-21.

RFP 74-10, "Programs for Severely Handicapped Children and Youth"

Bobby Palk, Project Director University of Alabama University, Alabama	A model service delivery program for a Tri-Mod population of severely handicapped children in a rural area. Developed and field tested packaged curricular modules, provided individualized parent services.
Don Ashurst, Project Director Diagnostic School for Neurologically Handicapped Children Los Angeles, California	A psycho-educational model which developed intervention strategies and an assessment battery of ordinal scales for evaluation of severely emotionally disturbed children aged 3-18.
Dennis R. Knapczyk, Project Director Indiana University Foundation Bloomington, Indiana	A comprehensive service delivery system for school aged severely emotionally disturbed children in a college-based demonstration school setting for pupils ages 6-12 years. Developed relevent curriculum, assessment procedures, parental services, and techniques for inter-agency involvement in IEP planning.

RFP 74-10 Cont'd

Charles Spellman, Project Director Project MESH Parsons State Hospital and Training Center Parsons, Kansas	A demonstration language training, survival and domestic skills training, and pupil assessment for severely mentally retarded children ages 4-18 years. Coordinated with local public and private schools in development of a community based model.
Lawrence Turton, Project Director University of Michigan Ann Arbor, Michigan	A demonstration project of educational and assessment services for severely mentally retarded children, aged 3-18. Incorporated home programs in the curriculum of the classroom.
Ruby Luna, Project Director Esperanza Para Nuestros Ninos Albuquerque, New Mexico	A model program for bilingual multicultured, severely handicapped children and youth aged 0-21 years. Featured staff and parent training and their active involvement in implementing project activities and in advocacy for severely handicapped children.
Victor Baldwin, Project Director Teaching Research Division Oregon State System of Higher Education Monmouth, Oregon	A comprehensive service delivery program for severely emotionally disturbed and multi-handicapped children aged 6-18 years with emphasis on curriculum development, teacher preperation, parent involvement, and group home development. A JDRP-validated model.
Barbara Fuzzano, Project Director Meeting Street School Providence, Rhode Island	A service delivery model for crippled multi-handicapped children aged 2-12 years which included child diagnostic evaluation curriculum development, parent consultation service, inservice staff training and coordination with related agencies.
Norris Haring, Project Director University of Washington Seattle, Washington	A demonstration service project providing screening, diagnostic and prescriptive services for severely/profoundly retarded, emotionally disturbed and multiply handicapped children and youth aged 0-21 years. Emphasized curriculum development and staff inservice training.
Tim Crowner, Project Director Madison P.S. District 8 Madison, Wisconsin	A public school-university cooperative preservice/inservice training program providing direct services to severely/profoundly handicapped children aged 0-19 years. Developed assessment procedures and curriculum based on individual child needs.

RFP 75-14, "Severely Handicapped Children with Auditory Impairment"

Dorothy Coleman, Project Director Baltimore City Public Schools Baltimore, Maryland	An interagency coalition of educational, medical and social agencies providing a community school-based, interdisciplinary training project for auditorially impaired, multi-handicapped children aged 0-21 years. Developed strategies for deinstitutionalization.

PROGRAMS FOR SEVERELY HANDICAPPED CHILDREN AND YOUTH (Continued)

RFP 75-15, "Severely Handicapped Children with Severe Emotional Disturbance"

Richard Simpson, Project Director University of Kansas Kansas City, Kansas	A public school demonstration project for severely emotionally disturbed children aged 6-18 years. Developed curriculum, assessment procedures and instrumentation, and techniques for integrating severely emotionally disturbed children into home environments.

RFP 75-16, "Severely Handicapped Children with Orthopedic Impairment"

Wayne S. Sailor and Ray Foster, Project Directors University of Kansas Neurological Institute Lawrence, Kansas	A demonstration project utilizing a bio-feedback approach to motor training for severely handicapped children with orthopedic impairment, aged 3-19 years. Produced assessment, curriculum, staff and parent materials.

RFP 75-17, "Severely Handicapped Children with Visual Impairment"

Stanley L. Bourgeault and Randall Harley, Project Directors George Peabody College Nashville, Tennessee	A diagnostic/evaluative and educational services delivery model which provided a recreational, provocational and vocational training program for severely handicapped children with visual impairment, aged 0-19 years. Developed curriculum, assessment, parent and staff training materials.

RFP 75-18, "Severely/Profoundly Retarded Children"

Diane Bricker, Project Director Mailman Center for Child Development-Debbie School Miami, Florida	A model program of assessment, curriculum development, and ancillary services for infants and young children aged 0-6 years. Demonstrated efficacy of early intervention with severely/profoundly retarded children. A project validated by the Department of Education's Joint Dissemination Review Panel.

RFP 75-19, "Severely/Profoundly Retarded Youth"

Josephine Dotson, Project Director Maryland State Department of Education-Bear School 301 Baltimore, Maryland	A public day school program which provided screening and diagnostic services and prescriptive instruction for severely/profoundly retarded youth aged 8-21 years. Featured deinstitutionalization and inter-agency coordination.
Floyd Dennis, Project Director George Peabody College Nashville, Tennessee	A demonstration project designed to move severely/profoundly retarded children and youth aged 0-21 year from a residential to a public school setting. Developed and refined a curriculum of independent and group living skills.

PROGRAMS FOR SEVERELY HANDICAPPED CHILDREN AND YOUTH (Continued)

RFP 76-17, "Severely Handicapped Children with Auditory Impairment"

Jerome Schein, Project Director New York University New York, New York	A model public day school project providing a comprehensive, prescriptive, educational program for multi-handicapped hearing impaired children aged 3-18 years. Focused on social learning, educational home programs and total family involvement.

RFP 76-18, "Severely Handicapped Children with Emotional Disturbance"

John Rosser, Project Director Project RESPOND Dept. of Health & Corrections Augusta, Maine	A community based service project designated to facilitate transitional placements between residential treatment and community placements. Provided habilitative services for severely emotionally disturbed children aged 6-18 years.
Donald Palmer, Project Director School Within Schools Muskegon Public Schools Muskegon, Michigan	A model of comprehensive services: diagnostic, physical, and psychiatric evaluation, and educational programming to severely emotionally disturbed children, aged 3-21 years. Developed curricular, staff and parent training materials.
Paula Matherne, Project Director Project REAL Dept. of Mental Retardation Whitten Village Clinton, South Carolina	A reality therapy model which provided specialized physical, occupational, speech and hearing therapy; vocational training; recreation; community services; and psychological and educational services to severely emotionally disturbed children ages 8-21 years.
Peter Knoblock, Project Director The Learning Place Syracuse University Syracuse, New York	A psycho-educational model school program for severely emotionally disturbed children aged 3-10 years, featuring integration of seriously disturbed and typical children. Utilized observational approaches to study interaction of handicapped with non-handicappped.

RFP 76-19, "Severely Handicapped Children with Orthopedic Impairment"

Patricia Montgomery, Project Director Project VIP Independent School District 625 Special Education Department St. Paul, Minnesota	An intensive program of preschool and homebound services for nonverbal, non-mobile children including those who cannot attend school for complex medical reasons. Provided individualized programming through a multidisciplinary approach for severely handicapped, orthopedically impared children aged 0-18 years.

RFP 76-20, "Severely Handicapped Children with Visual Impairment"

Peggy Mosely, Project Director Project HAND Lafayette Parish School Board Lafayette, Louisiana	A model preschool intervention program to visually impaired severely handicapped children aged 0-8 years. Focused on mainstreaming of handicapped with non-handicapped peers and development of daily living, social, and mobility skills.
Garu P. Sharma, Project Director Upsal Day School for Blind Children Philadelphia, Pennsylvania	A individualized, sequential, educational program providing identification, screening, diagnostic and prescriptive service for visually impaired, severely handicapped children aged 3-18 years. Developed special low vision education and teaching materials and techniques.

PROGRAMS FOR SEVERELY HANDICAPPED CHILDREN AND YOUTH (Continued)

RFP 76-21, "Severely/Profoundly Retarded Children (0-8 Years)"

Linda Lake, Project Director Project CHAIN Dept. of Child Development Tempe, Arizona	A comprehensive educational program to meet differing needs of children during infancy and the preschool period. Provided diagnostic and prescriptive services for severely, profoundly retarded children aged 0-8 years and training for their parents.
Carol Peterson, Project Director University of Illinois at Chicago Circle Chicago, Illinois	A multidisciplinary service delivery model for infants and preschool aged severely/profoundly retarded children, aged 0-8 years, and their families who were confronted with complications of poverty, multilingualism and multiculturalism.

RFP 76-22, "Severely/Profoundly Retarded Youth (6-21 Years)"

Ed Boucher and Richard Lyon, Project Directors Multi-Handicapped Center of Penobscot Valley Bangor, Maine	A project for developing normalization in institutionalized severely/profoundly retarded youths aged 6-21 years. Developed a curriculum in self-help, language, motor, social, and intellectual development.

RFP 77-10, "Severely Handicapped Auditorially Impaired"

Thomas Goulder, Project Director Beverly School of the Deaf Beverly, Massachusetts	An established model psycho-educational center to provide cooperative care plus treatment and education to auditorially impaired, multi-handicapped children aged 6-12 years.
Richard Nowell, Project Director Pennsylvania State University University Park, Pennsylvania	Provided services to auditorially impaired, multi-handicapped children and youth, aged 6-21 years, using the Child-Based Information System, a conceptual, standardized procedure for recording student progress which was used in designing instruction on an individual basis.

RFP 77-11, "Severely Handicapped Emotionally Disturbed"

Patricia Williams, Project Director Project EDUCATE Indiana University Foundation Developmental Training Center Bloomington, Indiana	Demonstrated that severely emotionally disturbed children aged 6-21 can be educated through developmental assessment and curricular strategies; parents of these children can be trained as active participants, and social workers are able to assist families in an educational capacity.
Mark Stewart, Project Director Division of Child Psychiatry University of Iowa Iowa City, Iowa	A model program to determine the educational/training system which can best evaluate autistic youngsters aged 6-21 and coordinate the home and school objectives. Services included systematic evaluation and a behavioral approach to instruction of each child.
Bertram Ruttenberg, Project Director Developmental Center for Austic Children Philadelphia, Pennsylvania	Utilized auxiliary services to maximize the mainstreaming of severely emotionally disturbed multihandicapped children and youth aged 6-18 years.

RFP 77-12, "Severely Handicapped Orthopedically Impaired"

Patricia Lantz, Project Director Holly Center Salisbury, Maryland	A rural based service delivery system for severely handicapped orthopedically impaired children aged 5-21. Translated educational goals into quality changes in the experiences within a residential facility and facilitated the transition of students into community settings.
Philippa Campbell, Project Director The Children's Hospital Medical Center Akron, Ohio	An inter-agency model which provided individual medical/educational assessment/planning, and training within a continuum of settings. Utilized medical-educational input in development of skills necessary for progression of seriously handicapped/orthopedically impaired children aged 6-21 years to more normal placements.
Barbara Fazzano, Project Director Project PROMISE Meeting Street School, Easter Seal Society of Rhode Island East Providence, Rhode Island	Developed an instructional model to supplement the basic educational program for severely handicapped, orthopedically impaired children aged 9-18 at home that will lead to optimal self-sufficiency. Focused on communication, independent living, and readiness skills.
Joyce Scheffler, Project Director Capital Area Rehabilitation Center Austin, Texas	Developed and implemented a training and related service model which included: screening and referral service, in depth evaluation and diagnosis, individualized education programs for severely handicapped/orthopedically impaired children aged 6-18, counselling for parents, and preservice and inservice training for staff.
Brenda D. McBryer, Project Director Shawnee Hills Regional Center Dept. of Mental Health Institute, West Virginia	A home-based training program for orthopedically impaired children aged 6-21 years who were virtually immobile and unable to participate in any center-based services. The project attempted to reduce institutionalization and maximize child development in normal life environments.

RFP 77-13, "Severely Handicapped Visually Impaired"

Josephine Pall, Project Director Oak Hill School Hartford, Connecticut	A model classroom to serve severely handicapped, visually impaired youngsters aged 6-18 years by modifying their traditional full-time educational/training program. Included emphasis on personal living and vocational potentials, a comprehensive assessment and diagnostic procedure, and a prescriptive, individualized education and training program.
Paul Yeager, Project Director Luzerne Intermediate Unit Kingston, Pennsylvania	A program to provide individualized educational services to children aged 6-21 years through intensive, itinerant programming. Included training for maximum use of residual vision, and effective use of unimpaired senses; special training in gross and fine motor, conceptual, language and communication, self-help, social, and emotional skills; orientation, mobility, prevocational and vocational training.

RFP 77-13 Cont'd

Martha Murrell, Project Director MHVI Project Texas School for the Blind Austin, Texas	A project to prevent and/or remediate potential developmental and educational delays in visually impaired, severely handicapped students aged 6-20 years through field consultation to participating children and staff concurrent with present delivery of services. Included training of staff, curriculum guidance, diagnosis and evaluation, coordination of interagency efforts; and parent training.

RFP 77-14, "Severely/Profoundly Mentally Retarded Children and Youth"

Sharon Freagon, Project Director Northern Illinois University Dept. of Special Education Dekalb, Illinois	An ecological intervention model coordinating home and school environments of severely retarded youngsters aged 9-18 years. Individualized school and home education and management programs were based upon indepth ecological assessments developed for each participant with the objective to enhance each student's daily living, communication, and prevocational habits.
Charles Spellman, Project Director Project PRIDE Parsons Research Center Parsons Hospital & Training Center Parsons, Kansas	A public school demonstration project for severely handicapped children aged 5-21 years living in a rural, sparsely populated area. Provided technical support to rural schools, state departments, and universities desiring assistance in developing educational programs for severely and profoundly handicapped students in rural areas.
Michael Bender, Project Director John F. Kennedy Institute Baltimore, Maryland	Developed a classroom system for profoundly retarded students aged 6-21 years for replication in the "average" public school using only "average" resources. The students were provided in-depth assessment and diagnosis upon which individual objectives and prescriptions were based. The model included modification of classroom facilities to meet individual learning styles.
Keith Larson, Project Director Special Education Department Portland State University Portland, Oregon	Developed a model for training severely handicapped individuals aged 8-21 years to acquire prevocational and vocational skills which would allow them to be placed on jobs in the community. Included a prescriptive program based upon individual assessment, behavior modification, job training and job placement. Developed an assessment instrument, a vocational curriculum, a training packet for professionals and a manual for training procedures.
Nathan Fama, Project Director Project for Institutionalized Severely Mentally Retarded Philadelphia, Pennsylvania	A project which secured community placements for severely mentally retarded children aged 4-21 years and developed a model for replication. Offered residents evaluation/training in the areas of self-help, communication, and behavioral compliance as a preparatory measure for exploring alternative living arrangements.

RFP 77-14 Cont'd

Beth Stephens, Project Director Special Education Program University of Texas at Dallas Richardson, Texas	Developed a service delivery system which emphasized appropriate, self-initiated interaction between the severely/profoundly mentally retarded child aged 6-21 years and his environment. Included preservice and in-service interaction training for staff and parents, and supervised parent interaction.
Sebastian Striefel, Project Director Exceptional Child Center Utah State University Logan, Utah	A model program of education/training for severely/profoundly retarded children and youth aged 6-19 years. Included procedures for determining eligibility, assessing and diagnosing each student's physical and mental functioning levels; provided individual service plans with three parts: and an individual education plan, individual health plan, and individual social service plan.
Jan Gendreau, Project Director Project APT Fairfax County Public Schools Kilmer Center Vienna, Virginia	Provided an interdisciplinary team to assist parents and teachers to develop an individual education program for students aged 6-21 years after gathering information about each student's level of performance, and screening each participant for problems in hearing, vision, behavior physical and oral functioning.
Al Lynch, Project Director Washington State Department of Public Instruction Olympia, Washington	Provided systematic, prevocational/educational services to students aged 13-21 years with attention to entry-level behaviors for vocational and living placements; provided evaluation and ongoing assessment of student competencies; coordinated a continuum of services to home, schools, and related community agencies.

RFP 77-20, "Outreach Programs for Severely Handicapped Children and Youth"

Donald Ashurst, Project Director Diagnostic School for the Neurologically Handicapped Los Angeles, California	An outreach project replicating components of a differential, psycho-educational assessment program through statewide demonstration and training of project and other personnel.
Victor Baldwin, Project Director Teaching Research Division Monmouth, Oregon	An outreach project providing technical assistance in the education of severely handicapped children and replicating successful components of the original demonstration model which included prescriptive programs, individualized instruction for behavior, self-help, language, motor, and cognitive skills.
Valerie Lynch, Project Director Experimental Education Unit University of Washington	An outreach project providing technical assistance to selected state and locally funded programs for the severely handicapped within public schools settings in the state of Washington, through systematic instruction and an interdisciplinary team approach.

PROGRAMS FOR SEVERELY HANDICAPPED CHILDREN AND YOUTH (Continued)

RFP 78-9, "Model Projects for Severely Handicapped Youth"

Bonnie Wuerch, Project Director University of Hawaii at Manoa Honolulu, Hawaii	Developing a leisure time activities curriculum component which can be used within the classroom to supplement existing educational programming for the severely handicapped adolescent, aged 13-18 years.
James McLean, Project Director Bureau of Child Research University of Kansas Parsons Research Center Parsons, Kansas	Identifying and assessing the generic interactive and processing skills which are essential to the acquisition of new skills and the productive use of a "normalized" environment, for severely handicapped youth aged 14-18 years.
Sandra Alper, Project Director Department of Special Education University of Missouri-Columbia Columbia, Missouri	Providing vocational habilitation services to severely handicapped youth, aged 13-18 years including acquisition and maintenance of vocational skills, transfer of these skills of work settings and adaptive/social skills related to successful habilitation.
Tom Bellamy, Project Director University of Oregon Eugene, Oregon	Providing services to multiply handicapped/severely retarded adolescents aged 13-18 through direct assistance to teachers; development, testing and dissemination of a generic vocational domain of the Oregon Statewide Student Progress Record.
Lou Brown and Lee Gruenewald, Project Directors University of Wisconsin Madison, Wisconsin	Developing strategies for designing age appropriate curricular content in public school service delivery models to prepare a wide range of severely handicapped students ages 13-18 years to function as independently and as productively as possible in post-school community, vocational, domestic, and recreational environments.

RFP 78-10, "Programs for Severely Handicapped Children and Youth Domestic - Outreach"

Randall Harley, Project Director George Peabody College Nashville, Tennessee	Providing technical assistance in staff training, cooperation and coordination with community agencies, and parent services, in the replication of the organization's model vision demonstration project.

RFP 78-30, "Model Projects for Deaf-Blind Youth"

David Templeman, Project Director Teaching Research Monmouth, Oregon	Demonstrating that deaf-blind students, aged 13-21, can be educated in a non-categorical classroom. Plans to identify practical, functional training methods, procedures and materials for prevocational training of deaf-blind students specific to work settings.

PROGRAMS FOR SEVERELY HANDICAPPED CHILDREN AND YOUTH (Continued)

RFP 78-31, "Model Projects for Deaf-Blind Children"

Lori Goetz, Project Director Bay Area Severely Handicapped/ Deaf-Blind Project Frederic Burk Foundation San Francisco, California	Providing non-segregated services for deaf-blind children aged 5-12 years. Refers students to their original severely, multi-handicapped/deaf-blind classrooms following reformulation of IEPs and two week intensive training program at the project site.
Jerome D. Schein, Project Director Deafness Research and Training Center New York, New York	Providing services to children who presently are at home or in custodial institutions without suitable educational programs. The project provides a comprehensive and continuing assessment of the deaf-blind student and incorporates total family involvement to assist families in the development of their handicapped children, aged 2-18 years.

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20 U.S. Code 1401 (7); 45 Code of Federal Regulations 121.2.

CHILD ASSESSMENT

Owen R. White

ANALYSIS

According to the Encyclopedia of Educational Evaluation (Anderson, Ball, and Murphy, 1975):

> ...assessment, used precisely, has a narrower meaning than evaluation but a broader meaning than measurement. In its derivation, the word "assess" means to "sit beside" or "to assist the judge." It therefore seems appropriate... to limit the term "assessment" to the process of gathering data and fashioning them into an interpretable form... (p.27).

In contrast, measurement is held by most people to be the simple act of quantification (e.g., Cooley and Lohnes, 1976; Sax, 1974), and evaluation is generally believed to extend directly into decision-making (e.g., Anderson, Ball, and Murphy, 1975; Stufflebeam, Foley, Gephart, Guba, Hammond, Merriman, and Provus, 1971; White, Note 1). That is not to say that assessment is divorced from decision-making, for, as Anderson, Ball, and Murphy (1975) are careful to point out: "...the entire assessment process may be planned in light of plausible alternative decisions" (p.18). The difference between assessment and evaluation lies not so much in their orientation toward decision-making, but in the degree to which the decision itself is actually a part of the process. Assessment leads up to the decision, but only "assists the judge," who may or may not base the final decision solely on the information provided by the assessment. In evaluation, since the decision is part of the predetermined process, the decision must follow directly from the information provided.

Educators who have studied assessment and evaluation in some depth would generally tend to agree with the distinctions made above (e.g., Salvia and Ysseldyke, 1978; Stufflebeam, Foley, Gephart, Guba, Hammon, Merriman, and Provus, 1971) but, if one examines the commonplace usages of the terms, an interesting problem arises. By saying "child assessment" one implies a somewhat imperfect relationship between the process of collecting information and arriving at a final decision. By referring to "program *evaluation*," on the other hand, one implies that the final decision will be a direct and predictable outcome of the information collected. Are decisions concerning children so much less predictable than those involving programs? Perhaps, and, indeed, the differential application of those terms may say something very profound about our traditional perceptions of individual pupil-oriented education.

Historically, education has been perceived as more of a privilege than a right (White and Liberty, 1976). Programs were generally inflexible in their approach to instruction and the only decision concerning individual children of any import was whether or not a given child would be allowed to participate in a program at all. Up to a certain point, that decision could be made much more profitably on the basis of economic factors, political influences, and social status than through any concern for the pupil's characteristics *per se*. When interest in pupil performance did begin to materialize on a large scale, it still took an elitist form -- norm-referenced tests were developed so children could be identified (and excluded) on the basis of their presumed inability to benefit from the educational system as it then existed (Binet and Simon, 1916; Colvin, 1921; Woodrow, 1921). Although educational practice did become more child-oriented and flexible over the next half-century, a basic exclusionary/segregationist attitude continued to dominate. Concern still focused on the development of "generally better" programs capable of serving "most children." Those children who fell too far outside the established norms were grouped together in special classes, separate schools, or residential facilities. If educational services were provided at all, they still tended to be "class-oriented" with each "type" of pupil receiving a basically uniform program. In 1971 the Congress of the United States attempted to deal with that problem by providing economic incentives for the improvement and expansion of special education and related services (P.L. 91-230, the Education of the Handicapped Act). Incentives alone did not seem to be effective, however, so the Congress became more directive in 1974 by mandating the identification and evaluation of all handicapped children and the establishment of full educational opportunities for those children no later than 1981 (P.L. 93-380). Finally, in 1975, the Education for All Handicapped Children Act (P.L. 94-142) was passed with even stronger admonitions and regulations to "assure that all handicapped children have available to them a free appropriate public education which emphasizes special education and related services designed to meet their *unique needs*."

The implications for child assessment of the latest federal law are numerous. Most importantly, the law stresses the need for designing individualized educational programs to meet individual needs. P.L. 94-142 not only forbids exclusion from education, it also disparages the use of "standard" programs for pupils with "standard" handicapping conditions. Each child must be assessed as an individual and treated educationally as such. Three points in the law are especially relevent to this chapter. First, assessments must be non-racially and non-culturally discriminatory. That is, tests or procedures cannot be used if their results will place a pupil at a disadvantage simply because of his or her racial or cultural background. Second, the Individualized Educational Plan (IEP) must include a statement of the pupil's present levels of educational performance. Third, there must be an explicit statement of each pupil's annual goals and intermediate objectives, including criteria and evaluation procedures for determining, at least annually, whether those goals and objectives are being met. Those three provisions imply that an individual pupil's needs will actually be taken into account when developing and implementing special programs to meet those needs. Unfortunately, implications might not translate into reality.

While the law says that discriminations cannot be made on the basis of culture or race, it doesn't really say that educators must discriminate pupils on the basis of true educational need, either. A statement of the pupil's present levels of educational performance is required, but the law does not really say how that information must be used in actually developing a program. Similarly, while the law says that the progress of the pupil must be monitored, it does not require that the program be changed if progress is found to be less than satisfactory. In short, the law is quite explicit in defining how information must be collected and treated (assessment), but leaves the issue of decision-making (evaluation) open to question. Why? There seems to be a general concensus of opinion that, for the most part, we are still in a process of learning how to use the information we collect and treat so precisely to make equally precise and effective decisions. One cannot mandate what we all too infrequently know how to do. For that reason, I am resigned to the hopefully temporary necessity of using the term child assessment rather than child evaluation. I am not resigned, however, to the exclusion of decision-making from consideration altogether and so shall include that element in the definition of child assessment as it will be addressed in this chapter:

Child assessment, as it will be used in this chapter, refers to the process of gathering, organizing and analyzing information in a manner which will facilitate timely and appropriate decisions concerning programs designed to meet the needs of an individual pupil.

In the remainder of this section, each element of the definition provided above will be discussed in some detail, especially as it pertains to model programs. In the remaining sections of this chapter, attention will turn to specific assessment issues, current assessment practices in model programs, and apparent trends in the state of the art.

"...Individual Pupil"

Judging from the descriptions prepared by many model programs, educators are prone to confuse child assessment and program evaluation or to see one as an extension of the other. The purposes of the two systems really do not lend themselves to such an isomorphic interdependency.

Program evaluation decisions involve the development, implementation, refinement and/or termination of general programs designed to serve whole groups of children. For example, program evaluations might be set up to help decide which buildings and facilities need to be constructed, what staff must be hired, how the staff should be trained, or what general curriculum materials should be purchased (e.g., Stufflebeam, Foley, Gephart, Guba, Hammond, Merriman, and Provus, 1971). In some cases, the decision will affect all children in a program (e.g., all children might be placed in the same facility), while in other cases decisions will affect only subgroups of children (e.g., not all children will require all of the special service options a program offers). In each case, however, the overall purpose of program evaluation is to help the educator make informed choices while deciding how to set up a general framework for meeting the needs of some target population.

In child assessment, the focus shifts from the overall effectiveness of a general program to the specific needs of each individual child. Perhaps, for example, a certain approach to teaching self-help skills works with most children, but one child may need something different. Most children in a particular program might progress well with only a half-hour of special help, but one particular pupil may need considerably more time. Within the general framework established through careful program evaluation, it is the purpose of child assessment to help in deciding which specific options should be employed for each individual child and, when none of the general options appear adequate, to guide in the development of new programs which will meet the child's individual needs.

Some of the elements of a system designed to facilitate an overall program evaluation might be borrowed from an existing child assessment system or vice versa. Perhaps a test used to evaluate overall program success is also useful for deciding which pupils should be transferred to another program. Planned overlap between systems should be encouraged but, for at least two reasons, it is unlikely that a child assessment system would adequately meet all program evaluation needs or vice versa. First, in most program evaluations, it is desirable to collect comparable data on all children within the program so a comprehensive and meaningful picture of overall program success can be formulated. When making decisions concerning individual pupils, on the other hand, the system must be flexible enough to allow the collection of whatever information is of most use in that individual case -- even if some or all of that information would be of little or no use in making decisions for other children. Secondly, appropriate child assessment will frequently lead to rapid program changes and modifications, whereas meaningful program evaluation often requires that the program be consistently applied over some predetermined period. If a pupil appeared to be having difficulties during the first few days of a new vocational program, child assessment might prompt a change in the program. If the focus were on the evaluation of the program itself, the program might be continued without change in order to give it every opportunity to work. In short, even if the same basic information is being collected, the functional outcomes of child assessment and program evaluation can still be in virtual opposition to one another. The role which each system plays in the development and conduct of a program is entirely different from that of the other.

"...Decisions..."

Since the purpose of child assessment is to help the educator make decisions about individual pupil programs, the development of a child assessment system must begin with the specification of the actual decisions that need to be made. Some care is required, for, if this step in the process of system development is not properly completed, the whole system will be directionless or, perhaps worse, misdirected. For example, one model program reported that it was developing a system to help educators decide which of a pupil's prevocational skill development needs was greatest.

That seems reasonable, but on closer inspection, knowing a pupil's performance deficits will not necessarily result in any particular action concerning his or her program. Instruction might begin with skills which relate to those needs, but work might just as easily proceed with other, seemingly less important skills -- prerequisite skills, skills of immediate concern to the parents, or even skills which are obviously unimportant, but which can serve as simple instructional targets during a period when the teacher and pupil "get to know one another."

"Deciding" which of a pupil's needs are greatest amounts to little more than arriving at some conclusion, discovering some fact or bit of information, or making some statement of belief. Many of the presumed purposes of child assessment fall into that type of category. While such information may have tremendous impact on the pupil's program, then again it might not. It is important, therefore, to make a distinction between "determinations" (the process of documenting or discovering something) and "true decisions" (the process of making a choice among possible actions which will directly affect the future course of a child's program). One may lead to the other, but, in the long run, it is the decision -- the action -- that counts. A few examples might illustrate the point more clearly:

> One might try to determine a child's skill development needs as one piece of information useful in deciding where instruction should begin.
>
> If we could determine whether a child had a hearing deficit, it might be easier to decide which of several communication programs we should try with the pupil first.
>
> By determining whether a pupil is having trouble in a regular class, we can begin the process necessary for deciding whether the pupil should be admitted into a special education program.

In other words, when describing the decisions which an assessment system is designed to facilitate, care should be taken to make explicit reference to the actions which should result from the decision.

"...Appropriate..."

The question of whether a decision is "appropriate" is terribly complex and subject to a number of qualifications. It is simple enough, for example, to say that a programmatic decision is appropriate to the extent that it results in an improvement in the pupil's life (Stufflebeam, Foley, Gephart, Guba, Hammond, Merriman, and Provus, 1971). Defining "improvement" and weighing the relative merits of different sorts of improvement are completely different matters. P.L. 94-142 attempts to deal with those problems by at least distributing the responsibility for major decisions among several people, including teachers, local administrators, relevant specialists, parents and, when possible, the pupil himself or herself. Still, the group dynamics of that process are frequently less than satisfactory and often subject to clearly inappropriate influences like personal pressure, availability of programs and resources, the pupil's sex or race, and the vested interests of social agencies and advocacy groups (Holland, 1980). Clearly, the resolution of all those problems is beyond the scope of this chapter. It may be possible, however, to outline at least a few considerations which might be made when trying to determine whether an assessment process has led to an appropriate decision.

Borrowing from traditional testing theory, one might assume that a decision is valid to the extent that it accomplishes what it was intended to accomplish (Anderson, Ball, and Murphy, 1975; English and English, 1958). Before an assessment process is implemented, therefore, it would seem wise to obtain a clear consensus of opinion concerning the desired outcome and to test the validity of the process through an examination of the actual outcome. If, for example, the purpose of a screening and referral process is to identify those children who have a high probability of needing the types of services a program offers, one might examine the results of more detailed follow-up assessments to see just how many referred pupils actually turned out to need the services in question. If placement in the program is found to be appropriate for only 30% of the pupils, the screening process is obviously not a valid predictor of need. Of course, even if all referrals appeared to be appropriate, one would still have to examine at least a sampling of pupils who were not referred to make sure that pupils in need were not being overlooked.

The outcome of a decision-making process might also be validated at an even more basic level. Since, as defined above, decisions must relate to clear-cut actions, one might simply ask whether the action actually took place. If, for example, a child study team decided that a program must be developed in a particular curricular area, it should be safe to assume that the program was, in fact, developed and implemented. According to Alper (Note 2), that may not be a safe assumption at all. In a study of the IEP process in California, Alper discovered that a large percentage of the programs described on individual pupil IEP's were not implemented at any observable level in the classroom. While such poor correspondence between the IEP and classroom activities might be attributed to a simple lack of skill or professionalism on the part of the teachers involved, it might just as easily be laid at the feet of the decision-making process itself -- the decision reached by the group may have been uninterpretable, vague, inappropriate, or impossible to implement! One should ask, therefore, whether additional information should have been considered by the group or treated in a different manner to arrive at a more realistic and appropriate decision in the first place.

The reliability of the decision-making process can also influence the validity of a decision. What Salvia and Ysseldyke (1978) say about tests should also be true of decisions: "Reliability is a necessary but not a sufficient condition for valid measurement...the reliability of a test limits its potential validity (p.104)." As applied to assessment decisions, that might be translated to mean that if the same basic assessment information, treated in the same basic way, does not lead consistently to the same decision, then the decision itself may be invalid. The word may needs to be emphasized, however. The relationship of a test to a test score is considerably more direct than the relationship between a body of information and an educational decision. While we might assume that the same test, given to the same pupil, should always yield the same information regardless of the person administering the test, we cannot as easily divorce the role of the person in the total decision-making process. Different people will have different backgrounds and experiences with the pupil and may, quite legitimately, arrive at different conclusions. Still, to the degree that an assessment process does actually guide decisions in a clear-cut, replicable fashion, some confidence in the basic validity of the process might be gained.

"...to Facilitate..."

Many educators limit their concern for formal, well documented child assessment systems to areas where consistently appropriate decisions are difficult to reach. If, for example, the staff in a particular program seem to have some difficulty in deciding exactly where a pupil's instruction should begin in a curricular sequence, some attempt might be made to develop a more precise approach for making those decisions. If an informal approach appears to be working in some other area of the program, trying to impose additional structure might do more harm than good. Even if a new system would not disrupt the established pattern of success, the resources used to develop that system might be spent more profitably elsewhere. Still, when adopting a laissez faire attitude, it is important to realize that the decision not to develop a more formal system is almost certainly going to be influenced by individual skills and competencies. Other people might not enjoy the same success as current staff and previously unnoticed problems may come to light when someone leaves or a new person is hired. That may be of only limited concern with some programs, but it should be of paramount importance to model programs.

Model programs are not funded simply to serve the pupils in a given locality. They are funded to demonstrate an exemplary approach to the education of some group of handicapped pupils and to encourage the adoption and replication of that approach by other programs working with similar children. Even if the model program's staff does not appear to be having any problems with a particular type of decision, a careful analysis should still be completed of the competencies and skills which might be responsible for that success. If the analysis reveals the need for skills and competencies that are unlikely to be shared by the staff or programs adopting the model, then the development of formal assessment systems to offset those deficiencies should be seriously considered. The role of child assessment systems in model programs is not limited to the task of facilitating timely and appropriate decisions concerning individual pupils. It extends to a concern for making the basic program itself more easily and efficiently replicable by providing explicit guidelines for making the day-to-day decisions required to implement the program.

"...The Process..."

Despite the fact that many decisions "seem obvious" or are made on the basis of "snap judgments," the process of reaching virtually any decision can be analyzed in terms of several discrete steps (Anderson, Ball, and Murphy, 1975; Cooley and Lohnes, 1976; Erickson, 1976; Sax, 1974; Stufflebeam, Foley, Gephart, Guba, Hammond, Merriman, and Provus, 1971): information gathering, organization, analysis, and choosing among alternatives. Each step in the process is important and, as with the case of the weak link in a chain, a failure to consider carefully the best method for completing each step can result in unpredictable or inappropriate outcomes.

Information gathering. Before any valid decision can be reached concerning a pupil's program, information must be gathered to describe the pupil and other factors that might influence the outcome of the decision. Because the need for precise and meaningful information is so obvious, this step in the decision-making process has received ample attention in the literature. Literally volumes of material have been compiled discussing the types of information that should be sought and how it should be collected. Indeed, so much attention has been concentrated on this step in the process that educators are prone to reduce their concern for child assessment to the question of "which test should I use?". Even if we ignore the fact that such a question grossly oversimplifies the overall assessment process, the answer is still not simple. The selection of a test depends on the decision one wishes to make (a test that proves useful in child screening may prove worthless in developing an instructional plan), the types of pupils involved (methods for assessing object permanence in a sighted child are inappropriate for use with a blind child), and a host of other situational factors (who is available to collect the information, when the information must be collected, how damaging small errors in assessment results will be, etc.; Salvia and Ysseldyke, 1978). A formal test may not even be necessary or appropriate. Perhaps a questionnaire, a formal interview procedure, or even casual observation will serve as well or better in some situations. There is not panacea, no single type of information or procedure which will meet all of one's needs. Most important, one must bear in mind that while the information we collect can have a tremendous impact on the decisions we make, information gathering is still only the first step in the complete decision-making process. If the information we gather is not amenable to systematic organization and analysis, or does not have a direct relationship to the program options among which we must choose, all of our efforts will have been wasted. It will help, therefore, to get a more complete picture of the entire decision-making process before trying to reach any firm conclusions about the types of information which might be most useful.

Organizing the information. "Raw data," as it comes from a test or observation, is frequently too detailed or complex to use directly. The important features of that information must be transformed and/or reduced to make it more easily understood and interpretable. For example, daily behavior counts and observation times might be translated into statements of "rate per minute" to place them all in a common perspective. Those rates might then be charted or graphed in some way to make overall trends and daily ups-and-downs in the pupil's performance more obvious (White and Haring, 1980). Similarly, the item scores from a standardized achievement test might be summarized according to means, percentiles, or grade-level equivalents (Tallmadge, 1977), and related items on an aptitude scale might be plotted together on a profile to make certain areas of special interest more apparent (Henerson, Morris, and Fitz-Gibbon, 1978). Many commercially prepared assessment instruments include descriptions of how information can be transformed or displayed to make interpretation of results easier, but care should be taken to use only those procedures which are truly related to the decision one wishes to make. If, for example, the decision concerns acceptance of a child into some general program, percentile data which show the pupil's overall standing in major developmental areas may be useful. The same summaries might obscure the specific item performances of greatest value to a teacher trying to decide where a pupil's instruction should begin.

Analyzing the information. Analysis, for all intents and purposes, amounts to little more than placing information into some meaningful perspective -- comparing it to some preset standard or level of expectancy. Without a comparison, most information will be meaningless. For example, if someone were to say a particular pupil got a "12," we would not know what to make of it. Even if we learned that the "12" represented "12 digits per minute written correctly to answer math-facts," most of us would still be in the dark as to whether that were good or bad. If, on the other hand, we learned that most of the pupil's peers were able to complete at least 45 digits per minute on the same assessment probe, we might begin to reach a point where we could make a decision about the possible need for a change in instruction.

The standard of comparison used in an analysis is likely to have a tremendous impact on the eventual decision reached. In the example provided above, the pupil's peers were used as the standard, and the results of the comparison would lead someone to conclude that a change in the program is advisable. A comparison might also have been made, however, between the pupil's current level of performance and his or her average performance last week. That comparison might indicate that the pupil is actually improving very quickly and the program should be left alone. Neither comparison is necessarily better than the other. It depends solely on the decision one wishes to make and the assumptions upon which that decision will be formulated. If the decision concerns the integration of the pupil into a regular math program, and one makes the assumption that the pupil should be able to compete with his or her peers after integration, then the peer-referenced comparison makes sense. If, on the other hand, the decision concerned only the pupil's current program and its ability to facilitate continued progress, using previous performances as the standard of comparison is most defensible. Despite the fact that numerous articles have been written attacking norm-referenced instruments (e.g., Wilcox, 1979; Jones, 1973; White and Haring, 1978) and even the use or misuse of standardized criterion-referenced or achievement tests (Tallmadge, 1977; Jenkins and Pany, 1978), the point remains that such discussions in the absence of a clearly defined decision-objective are meaningless.

Choosing among alternatives. The final step in a decision-making process amounts to a choice among alternatives: will the pupil be integrated into a regular math program or continued in a special program? Will a pupil's special education math program be changed or left intact? At least two factors will influence the outcome of this step and the overall success of the assessment system *per se*.

First, the actual alternatives available to the decision-maker must be clear (Stufflebeam, Foley, Gephart, Guba, Hammond, Merriman, and Provus, 1971). Information gathering, organization, and analysis designed to clarify whether a pupil is making reasonable progress in his current math program implies that an option exists to change that program. Is that really the case? Upon close inspection, many model programs are so tightly defined that virtually no options exist concerning the way in which instruction proceeds. In order to change instruction, therefore, a complete transfer of the pupil to another placement would need to be arranged. That decision is likely to require information and authority not typically afforded to a teacher simply seeking a way to improve instruction within his or her own class. Even in a case where options do exist, care must be taken to ensure that the decision rules, for example, Liberty (Note 3) found that a common excuse for ignoring a rule designed to prompt program changes was, "I didn't know what else I could try, so I left the program alone."

Second, one must consider whether the decision-making process is relatively "closed" or "open." As explained earlier, the very term "child assessment" is usually appropriate because no explicit rules exist to define exactly how the information that is gathered, organized, and analyzed should be used to arrive at a definite, replicable decision. While that need not be the case (e.g., White and Haring, 1980; Haring and Liberty, Note 4), it is common. Even where decision rules appear to exist, they may be quite open-ended. For example, a group may state that a decision to integrate a pupil into a regular math program would not be made until he or she could complete work about as rapidly and as accurately as the normal peers in that program. Does that mean a level of performance equal to the mean peer performance? The median peer performance? Within one standard deviation of the mean? At a level equal to or higher than the 25th percentile of the peer group? Without getting more specific, there is obviously a great deal of leeway in the final decision that might be reached. That leeway may simply mean that all of the relevant variables cannot be specified in advance. It might also mean, however, that decisions will be capricious, postponed indefinitely, or inappropriate. Whenever possible, every effort should be made to provide specific guidelines for choosing among various program alternatives. If that seems inadvisable, the need for "clinical judgment" should at least be recognized and justified.

Additional factors. There are essentially five factors to consider in the design of each step in a decision-making process: (1)the general outcome to be achieved, (2)the person or persons who will be involved, (3)the timeline for completing the step, (4)the specific procedures that will be employed to complete each step and, (5)the overall balance and efficiency of the process. As with the steps themselves, each factor represents a critical element in the overall process and must be considered carefully.

Each step in the decision-making process should produce some definite outcome: information gathering should result in a precise statement of some one or more characteristics of the pupil or situational variables which must be considered in making the decision; organization should help to clarify the important elements and features of that information; analysis should place the information into some meaningful context and result in an appropriate comparison with a standard or expectancy; and the choices made at the end of the process should result in some direct action being taken to influence the pupil's program. Before getting too specific about those outcomes, however, it is usually wise to begin with general statements of what one wishes to accomplish. For example, before stating that information will be gathered using the WISC (and then trying to determine whether the WISC is an appropriate test for use with the pupil involved), it might be better to consider whether *any* sort of information concerning general cognitive functioning is desired. Similarly, before trying to determine whether a mean level of performance or a median level of performance might be more appropriate for summarizing the data, the need for some sort of average (as opposed to item scores) should be considered. Many debates concerning details will be avoided if general issues are resolved first.

The greatest single limiting factor in any decision-making process is likely to be the *people involved*. How many are there? Is communication a problem? How much time do they have? What expertise or experience do they have? Before those questions are resolved, any serious consideration of specific procedures will be premature. Perhaps, for example, information is clearly needed concerning a pupil's overall development. If test "X" will provide the most precise and reliable measure of that development, one would certainly be tempted to list its use in the procedures for information gathering. If, on the other hand, that test were so complicated that only specially trained personnel could administer it, and no such people were available, alternatives would have to be sought. Problems in experience and expertise are most likely to crop up when more than one person is involved in the process. Schematic profiles of hearing impairment expressed in decibels on a log chart of the auditory spectrum may be fine for a meeting of audiologists, but in a meeting with teachers and parents some additional "organizational" or "analysis" efforts may be required to make the implications of the losses clear (e.g., the functional impact of the hearing loss might be demonstrated by speaking at the levels which the pupil can or cannot hear). Time factors may also place severe restraints on the viability of various options. For example, teachers found it difficult to employ one decision rule in their classrooms that only took 20 seconds to apply (White, 1971), but had no difficulty in applying a similar rule that took only 2 or 3 seconds (Liberty, 1975; White and Haring, 1980). The difference in time may seem rather small, but, when one considers that the decision rule would have to be applied to as many as four or five programs on each of 20 or 30 children each day, the difference between 20 seconds and 2 or 3 seconds for each application is substantial.

Aside from the time required to complete any given instance of the assessment process, timing in a broader sense is often critical -- exactly _when and how often must the assessment be conducted_. For example, pupil performance on any of several standardized achievement tests might prove useful for making decisions concerning referral to special programs, but such information is most likely to be interpretable only at certain times during the year (Tallmadge, 1977). Similarly, decisions involving major curriculum changes are frequently most efficiently made at the end of a school quarter or year, while decisions involving the modification of instructional strategies may have to be made daily or weekly (White and Haring, 1976; Haring and Liberty, Note 4). Broad temporal constraints will have a tremendous influence on the usefulness and appropriateness of specific procedures and should be considered early in the development of any assessment system.

After the basic parameters of the system have been outlined (i.e., the "what, who, and when"), it should be possible to identify and select _specific procedures for completing each step_ in the assessment process. The level of detail actually necessary will depend in large measure on the degree to which the procedures represent "standard practice" and are commonly known. For example, it might be sufficient to state that "teachers will test each pupil during the last two weeks of October, using the Iowa Test of Basic Skills and following the procedures as outlined in the test manual," but it would not be sufficient to say that "teachers will summarize the salient features of the pupil's social development." The best way of determining whether procedures have been adequately specified, of course, is to have several people attempt to implement the procedures and then to examine the results. Edwin (Note 5) has suggested that the steps taken by an individual during the process be recorded (perhaps via videotape) and then analyzed by "experts" to identify which of the operations used were definitely part of the prescribed procedures, which were "neutral" (not part of the prescribed procedures, but still acceptable), and which were actually contrary or antithetical to the prescribed process. If most of the prescribed operations were followed, it might be assumed that the process is relatively well defined. As a further test of that assumption, however, Edwin (Note 5) advises that the person whose behavior was recorded also be asked to analyze the record. If that person accurately identifies which operations were part of the prescribed process and which were not, then it might be assumed that the process was truly well defined (even if the person chooses not to employ those operations in all cases), but, if the person involved identifies operations as part of the prescribed procedures when they were not (or vice versa), than it must be assumed that the process was not clearly defined or explained, even if the person just "happened" to follow the procedures relatively well.

Finally, the overall balance and efficiency of the operations must be considered. While it is important that the overall outcome of each step and the entire decision-making process be valid (accomplish what it is supposed to accomplish) and reliable (accomplish results in a consistent manner), it is also important that the assessment be conducted for the least possible cost in terms of dollars and time. At least two errors are common. First, the overall cost of the system may be so great that it cannot (or will not) be widely replicated. In one case, for example, a model program developed a pupil-tracking system that allowed teachers to make very precise predictions about pupil progress and, therefore, proved to facilitate appropriate decisions concerning pupil placements and programming. The system depended upon a very complex computer program to realize its full benefit, however, and could not be translated into languages used by other computers for less than tens of thousands of dollars. Obviously, the usefulness of that system in many situations is severely limited. A related, but more subtle, problem can arise when there is an inherent imbalance in the cost, effort, or sophistication of the various steps within a single assessment process. It is often said of computers, "Garbage in, garbage out" -- referring to the foolishness of developing sophisticated analytic procedures for information of questionable value. The reverse may also be true. One model program actually used 41 different assessment instruments with every referred pupil. Aside from the possibility that a system might have been developed to choose a smaller number of instruments for use with any given pupil (thereby reducing the cost of the overall system), there was still a fundamental problem of actually using all the information collected. While the information-gathering step in the process was clearly defined, the organization and analysis steps were described only as "getting all the testers together to discuss the results." As Holland (1980) points out, a situation as loosely defined as that is very unlikely to produce replicable, or even meaningful, results. If the information-gathering phase of decision-making was of such great concern to warrant 41 tests, the organization and analysis phases should have received equally extensive attention.

Summary

Child assessment should lead to decisions that have a direct impact on the future course of an individual pupil's program. Assessment systems are important for every educational program, but, since formal assessment systems can increase the replicability of a program, they are of special concern to model programs.

In devising child assessment systems, care should be taken to clearly define desired outcomes, the people who must or should be involved, timelines and temporal constraints, and the specific procedures to be employed. In some cases, general procedural statements may suffice for the entire decision-making process, but it will frequently be necessary to consider the steps of information gathering, organization, analysis, and choosing among alternatives separately. In either event, the overall process and/or individual steps in the process should be evaluated in terms of their validity (ability to accomplish the desired outcome), reliability (consistency of outcome), and overall balance and efficiency (absolute and relative costs).

APPRAISAL

In this section, attention turns to specific child assessment issues of special interest to model programs. Generally, each issue is analyzed in terms of the factors described earlier. It would not be possible to completely exhaust all of the possibilities in the space available, however, so the reader is advised to treat the discussions only as general outlines, rather than as definitive treaties. Since child assessment should be decision-oriented, each discussion will focus on some decision which model programs would generally wish to make regarding individual pupils. Before beginning, it might be helpful to review the criteria which can be applied for identifying those decisions warranting formal child assessment systems and to pre-review the specific decisions selected for discussion.

Which Decision?

Educators are continuously making one decision or another which could have a direct impact on a pupil's program. Some of those decisions obviously deserve the support of a formal, well-defined assessment system, and some are obviously best left to whatever informal system seems easiest at the time. For example, the Education for All Handicapped Children Act (P.L. 94-142) makes it pretty clear that decisions concerning the pupil's placement and overall program goals do warrant a formal assessment process, but no one is likely to really care how a parent decides whether the upholstery for a child's wheelchair will be blue or green. There are some decisions in the middle where the need for formal assessment is less certain. The following points might be considered when trying to make that choice.

The law. Obviously, any assessments required by state or federal law should be conducted as systematically as possible.

When examining legal requirements, however, it might be wise to remember the distinction between determinations and decisions. Many laws govern only the types of information that must be collected concerning each child and, perhaps, the people who should be involved in making the decision. As mentioned earlier, for example, P.L. 94-142 states that an Individual Educational Plan must contain a description of how progress toward intermediate objectives will be measured. It does not say that anything has to be done with that information. While there is an implication that a program will be modified if the pupil does not appear to be making adequate progress, it will be necessary to go beyond the basic requirements of the law and develop a system which leads directly to some meaningful point of decision in order to ensure that the intent of the law is truly fulfilled.

Options. In order to make a decision, some one or more options need to exist. If, for example, a particular program involves only one class and one teacher/therapist, no "placement decision" system will be required beyond the initial step of deciding that the general program would be appropriate for a pupil. With a program involving several different service/placement options, a system which only formalized the process of initial acceptance might not be enough. Similarly, a model which required that instructional programs be conducted for a minimum of two weeks before any modifications are considered might find little use for an assessment system designed to prompt and facilitate daily program change decisions, but a program which emphasized a rapidly changing approach to instruction might find such a system very useful.

It is best to think beyond the immediate range of the model program *per se* when considering options. Perhaps, for example, a particular model program offers only one approach to physical therapy. That would seem to obviate the need for a formal approach-selection assessment system. If other sites are likely to offer several options, however, it might be wise to delineate those factors which might be considered when selecting among those options (e.g., relationship to the overall model, pupil characteristics most often associated with success). Even if that selection process is never actually implemented at the original model program site, the outline of such a system would make it easier for other sites to integrate the program into their existing structures.

Probable impact. Decisions which have the highest probability of having a profound impact on a pupil's eventual success or failure should be given the greatest attention when developing assessment systems. Major program decisions, like transferring the pupil to a new program, come most quickly to mind and are most commonly considered as candidates for formal assessment systems. Care should be taken, however, not to overlook the cumulative effects of smaller, more frequently made decisions. Formal assessment systems have proven of significant worth even when applied to daily classroom instructional decisions (e.g., Bohannon, Note 6; Haring and Liberty, Note 4; Mirkin, Note 7; White and Haring, 1980).

Relation to model. Each model program is, presumably, based on some coherent, logical, and well-formulated set of assumptions or philosophy. Decision points which are critical to the maintenance of a program in accord with those assumptions or that philosophy should be formalized to whatever extent possible. For example, a program based on the assumption that each minute of a child's day should be highly structured and carefully planned will probably need a relatively formal system for deciding when each instructional intervention should be conducted. Without a formal system for making those decisions, it would be difficult to ensure that people attempting to replicate the program would behave in a manner consistent with its assumptions. Another program, on the other hand, based on the assumption that children should be allowed to provide "their own structure," would find no use for a formal system for deciding when instructional intervention should take place.

Confidence. If one is not really confident that the procedures which will lead to timely and appropriate decisions can be specified, the development of a truly formalized assessment system should probably be postponed. Prematurely formalizing a decision-making process will only reduce the role of clinical judgment ("informed opinion") and, thereby, run the risk of creating at least two problems: (a) decisions, while consistent, may turn out to be consistently wrong -- or at least "less right" than they might otherwise be, and (b) chances for discovering better ways of making decisions may be lost by reducing the natural variation in the types of decisions made and the way in which they are made. Of course, since children are so "unique," it is unlikely that we could ever be entirely confident of any decision. Some allowances for clinical judgment should probably always be made. The amount of clinical judgment encouraged (or, conversely, the degree to which the decision process is pre-specified) should depend on the confidence one has in the outcome.

Common Decisions

Although the specific child assessment needs of a program will depend upon a number of different factors like those outlined above, there are still at least three general areas of concern which face virtually every program: (a) deciding which placement and services will best meet the needs of each pupil; (b) deciding exactly how instruction or therapy should proceed; and (c) deciding when and how a pupil's general program and/or placement should be changed. Each type of decision may, in turn, require several smaller decisions to be made. Following a brief overview of those decisions, attention will turn to the factors that should be considered when developing systems to make those decisions.

Which specific programs and services should be offered to a pupil? Pupil placement and the arrangement of support services are considered by many to be the most important set of decisions that can be made for a pupil. More laws, court rulings, and regulations have centered on this aspect of child assessment than any other. At least three general areas of concern seem most common:

1. Referral: Should a pupil be considered for possible placement in a special education program or service? The purpose here is to find the pupils who might be in need of special education programs or services and to refer them for closer inspection. Examples would include child-find and screening programs currently conducted in most districts. Even in cases where a pupil is obviously handicapped, the question of referral to the programs or services most likely to meet the pupil's need still exists.

2. Initial assessment: Should a pupil be provided a special education program or service? Following initial referral, most programs undertake a detailed examination of the pupil's talents and needs to determine whether the referral was appropriate. If the pupil does not appear to require special services, the decision to leave the pupil in his or her present program (with or without some special support) will be made. If the pupil is found to require special services, a decision may be made to accept the pupil into the model program and develop an IEP or to refer the pupil to some other program better qualified to meet those needs.

How should instruction or therapy proceed? Once an IEP has been developed and the child has been placed in a program or services have been arranged, there is a tendency for many people to assume that the formal child assessment process has been completed (with, of course, the exception of regular annual reviews). From the standpoint of the teacher or therapist, however, the burden of making precise and timely decisions has just begun. At least two broad areas of decision-making have received attention:

1. Program design: Where and how should instruction or therapy begin? Most programs serving handicapped pupils do not assume that all pupils should begin instruction in exactly the same materials and at exactly the same point in the curriculum. Some series of "pretests" or "inventories" are usually planned to decide which specific curricular targets should be selected for initial instruction or therapy. Similarly, many programs allow for a wide variety of instructional and/or motivational strategies, and special assessments may be conducted to select those procedures which will have the greatest probability of success with each pupil.

2. Program modification: When and how should an instructional or therapeutic program be modified? Most educators are of the opinion that no single approach to instruction or therapy will always work, even if that approach was selected for the individual pupil on the basis of extensive pretests or inventories. Therefore, increasing numbers of programs are beginning to emphasize procedures for monitoring pupil progress on a regular basis to identify when and how instruction might be modified to improve the chances of success.

When and how should a pupil's placement be changed? Each pupil's program must be reviewed at least annually to determine whether his or her current placement and services are still appropriate. If the program is found to be inappropriate, presumably a decision will be made to change that placement. The process used to reach that decision will be similar to the one described above for making initial placement decisions, but the system should be expanded (to include information collected during the previous year) and, in some respects, reversed. Rather than beginning with the suspicion of a handicap, for example, the review would begin with a careful analysis of the degree to which the child's previously documented problem has been corrected. Alternative placements would also be investigated, not only with respect to original conditions which led to their previous inability to meet the needs of the pupil, but for the purpose of determining whether conditions have in any way changed which might alter their desirability.

In the sections which follow, assessment systems designed to facilitate each of the decisions outlined above will be discussed. Since space will not permit a complete analysis of all the factors listed earlier in this chapter, major concerns will be covered under three general headings: the overall purpose of each system; major evaluative criteria for each system; and special concerns in the development or operation of each system. (In preparing this chapter, the author was provided with reports concerning five model programs and was asked to make specific reference to those programs whenever possible. As the names of some of the projects involved are quite lengthy, they will be abbreviated in the text as follows: PRIDE -- Project PRIDE [Programming Regional Intervention for Difficult Children], University of Kansas; LEARN -- Project LEARN, University of Kansas; BAY -- Bay Area Severely Handicapped Deaf/Blind Project, San Francisco State University; CALIF -- California State Plan to Establish Demonstration Outreach Services for Autistic Children and Youth Under the Master Plan for Special Education, California State Department of Education; PROMISE -- Programs for Orthopedically Multiply Impaired in Self Realization Education, Meeting Street School, East Providence, Rhode Island).

When Should a Pupil be Referred?

Overall purpose of the system. The overall purpose of a child-find, screening, and referral system is to identify those pupils who *might* be in need of special (or at least different) services or programs. The question is not so much whether a pupil *is* handicapped, but, rather, whether there is sufficient reason to investigate the possibility of a problem more closely.

Presumably, virtually every program would be concerned with the early identification of pupils who might benefit from their services. Of those reviewed, however, only PRIDE stated an actual objective concerning child-find and, upon close inspection, the procedures outlined for reaching that objective were either vague or more appropriate for detailed initial diagnosis (see below). Still, as all of the programs reviewed served severely involved children with relatively well-defined handicapping conditions, they might reasonably expect appropriate referrals to be made without recourse to a formal child assessment screening system. In such a situation, a program would only have to provide clear descriptions of the population they intend to serve and make sure that those descriptions get into the hands of people in a position to find and refer appropriate pupils. All of the programs reviewed met those criteria.

Overall test of the system. There are two primary criteria for an effective child-find system: (a) all of the pupils who are referred should be referred (i.e., they meet the qualifications for acceptance into the program); and (b) all of the pupils who should be referred are referred (i.e., no pupil who would qualify for the program is overlooked).

The most common method of establishing the degree to which a system meets the first criterion (all referred pupils should have been referred) is to compare the results of initial screening with the results of a more in-depth assessment of pupil performance conducted after referral. If all referred children turn out to be accepted into the program, the referral system is considered adequate. Although all programs did conduct rather extensive assessements of every referred pupil, only one program (BAY) indicated that one or more pupils were found not to be qualified for acceptance into the program. It might be assumed, therefore, that current referral systems for the programs reviewed are generally adequate, at least with respect to the first criterion outlined above.

A more stringent analysis of the degree to which a system meets the first criterion would involve a comparison of pupil response to various programs. That is, instead of relying on concurrent validation of the screening process by comparing screening results with a more detailed examination of the child (i.e., an examination that might also yield misleading results), an analysis could be conducted of the predictive relationship between screening variables which led to referral and actual pupil success or failure after being admitted to a program. A complete analysis would necessitate random assignment of pupils to programs -- raising a number of serious ethical concerns. Partial analyses might be completed, however, by examining detailed pupil progress records for children who were placed on waiting lists or in other programs for extended periods before admission to the model program. None of the reviewed programs undertook such an analysis.

Addressing the second criterion of system adequacy (i.e., all children who should be referred are referred) is considerably more difficult than addressing the first criterion. To resolve that issue quickly, virtually all children in a given catchment area (or a random sampling of those children) would have to be provided with detailed follow-up examinations. If children are identified who qualify for services, but were not identified by the screening procedures, the screening procedures would have to be adjusted to make sure such children were not overlooked in the future. A second method of assessing the degree to which all children in need are identified as early as possible involves the longitudinal screening and follow-up of a large group of children. For example, if a district were to employ the same screening methods for ten years and keep records for all the children involved, it is likely that children with handicaps who are not referred during the early grades will eventually be referred during later grades. Their records from the earlier grades could then be reviewed to determine whether different standards or methods of analysis would have led to their referral earlier.

Despite the fact that finding all qualified children is obviously more important than avoiding unnecessary follow-up assessments with inappropriately referred children, none of the reviewed programs attempted a test of their referral systems. At least three reasons might be given for that omission: First, such analyses are clearly very expensive and/or would take longer to complete than the period for which model programs are funded. Second, most of the programs were serving children who might be considered quite easy to identify, so there was no reason to suspect that all qualified children were not being referred. Third, most of the programs reviewed were already serving as many children as they had been prepared to serve. Finding additional qualified children might, therefore, serve no useful purpose. This author sympathizes with the first rationale (and would suggest that appropriate fiscal resources be made available in the future); is willing to concede the possibility of the second rationale (for the programs reviewed, but certainly not for all model programs); but patently disagrees with the third rationale. Even if a given model program is already serving as many children as it is designed to serve, it would seem that there is still an obligation to identify a more extensive need if and when that need exists. If nothing else, finding additional children in need should act as an effective stimulus for program replication.

Special considerations for system design. Special considerations for the design of child-find/referral systems fall into three major categories: coverage, cost, and discrimination.

If a child-find system is to be effective, it must be employed with virtually every child who has any possibility of requiring special services. When dealing with relatively subtle handicaps (e.g., learning disabilities in young children), every effort must be made to institute a regular screening process in all classes within the catchment area. For programs serving severely handicapped children (i.e., children who should be easily identified), concern should focus on establishing working relationships with people and agencies who are most likely to come into early contact with qualified children (e.g., parents, hospitals, preschools). All of the reviewed programs fall into the later category (i.e., serving severely handicapped children) and had, indeed, established ongoing working relationships with a number of appropriate agencies and persons.

The coverage of a child assessment system will be determined, in part, by costs. The lower the cost of implementing the system, the greater the likelihood of its being used. If system costs are reduced so much as to impair its ability to discriminate children in need, however, the cost for operating other systems is likely to increase in one of two ways. First, if too many children are referred for consideration, the costs for conducting in-depth initial diagnoses with those children are likely to outweigh the savings in screening costs. Secondly, if children are overlooked for several years (until their needs are so great they can no longer be ignored), costs for providing service are likely to be greater (let alone the immeasurable loss to the child in time). Increased costs in screening must be balanced, therefore, against the possibility of false positives (too many children referred) and false negatives (too few children referred). Finally, when considering cost, the time of the individuals involved must be considered. Most referral systems involve a number of people outside of the project's staff per se. Overlooking the time and effort expended by those people to employ the system can be disastrous. Assessment procedures should be as simple and as direct as possible; the need for special equipment or experience should be avoided; and, above all, it should be as simple as possible for a referring agency or person to actually complete the referral (i.e., reach an appropriate party by phone or mail with some reasonable expectancy of a rapid response). None of the reviewed projects described its system in sufficient detail to determine their feasibility with respect to costs.

Discrimination is a two-edged sword. On the one hand, the law forbids the use of assessment instruments (for screening or other purposes) which discriminate against any child on the basis of race or culture. On the other hand, a screening system should be able to discriminate children in probable need of assistance. In a recent review of those issues, Bailey and Harbin (1980) paint a rather bleak picture. They conclude that while traditional approaches to norm-referenced tests are almost without exception clearly biased with respect to race or culture, criterion-referenced measures and local or special norm group approaches (e.g., the Black Intelligence Test of Cultural Homogeneity) may have their own, albeit different, biases. Most of the inherent bias in such instruments might be attributed to the fact that performance is measured at only one point in time and that the content of the questions posed and/or the conditions under which the test is conducted places certain cultures or races at a disadvantage (Kunzelman and Koenig, 1976; White and Haring, 1980). Screening instruments which assess a pupil's actual ability to learn or profit from experience over time have been developed (e.g., Budoff and Friedman, 1969; Feurstein, 1979; Kunzelmann and Koenig, 1976) and have shown a marked decrease in sensitivity to cultural or racial differences, but as Bailey and Harbin (1980) point out, there is little evidence that such learning measures accurately identify children with true handicapping conditions. To make things even more complicated, they state that "bias is not limited to the tests themselves, but is a problem with the entire decision-making process (p. 594)" -- a view held in common with Holland (1980). One cannot divorce oneself from the problem by simply lamenting the condition of tests. The possibility of discrimination at all levels of the decision-making process must be examined. Unfortunately, but perhaps understandably in light of the populations served, none of the reviewed programs addressed any of those issues.

Where Should the Pupil be Placed?

Overall purpose of the system. The main objective at this stage in the assessment process is to decide which of the several program options should be provided to best meet the needs of the pupil. That process is usually divided into three steps: (a) the verification that the pupil does, indeed, require some form of special education or related service, as opposed to continuation in the regular education program alone; (b) if a general need has been verified, the identification of the specific needs which must be met (setting individual goals and objectives); and (c) the selection of actual placements and services to meet those needs. Those steps are usually called, respectively, "initial assessment," "diagnosis," and "placement in the least restrictive environment." Together they constitute the foundation of IEP development as specified by P.L. 94-142.

Overall test of the system. Two basic criteria can be applied to the validation of the system as a whole (a) the pupil will make meaningful progress in the placement selected; and (b) the pupil will make greater progress in the selected placement than he or she would have made in any other possible placement.

According to proposed guidelines in the State of California (Clark, Note 8):

> In order to decide whether a pupil's progress is reasonable, it is necessary to determine whether (1) a pupil is demon-

> strating growth in those skills of greatest importance in relation to present and future development and (2) those skills are being learned as rapidly as one might reasonably expect. (p. 1)

Although guidelines for assessing skill importance have been suggested (e.g., Brown, Nietupski, and Hamre-Nietupski, 1976; White, 1980; White and Haring, 1980), the matter still appears to entail a considerable amount of "clinical judgment." P.L. 94-142 approaches that problem by distributing the burden of those determinations over all the people who might be concerned (the pupil, the parent, teachers, support personnel, and administrators) and by providing for due process in the event that disagreements among those people arise. California, in its expanded guidelines (Clark, Note 8), goes one step further by outlining in greater detail the steps through which child study team participants must go in order to reach consensus (e.g., obtaining information concerning a wide range of educational objectives, making sure the information is current, forming a direct link between assessment results and long-term goals). Other states and districts have established pupil tracking systems whereby actual pupil progress can be monitored over time to facilitate the development of expectancies (e.g., Oregon's Student Progress Record, Note 9; the System for Monitoring the Educational Performance of Students used in Great Falls, Montana, Note 10); and at least some educators have attempted to develop procedures for assessing the functional relevance of potential instructional or therapeutic targets (e.g., AAESPH, Note 11; Brown, Nietupski, and Hamre-Nietupski, 1976; White, 1980).

No single approach to the assessment of skill importance has yet met with full acceptance, and perhaps none ever will. The determination of absolute criteria for making such decisions may remain a moral/ethical issue beyond the scope of empirical validation. Even if that is the case, however, it is clear that the persons most closely associated with the pupil's program must reach agreement concerning the relative importance of various needs, the way in which those needs should be translated into objective goals and objectives, the criteria for assessing the degree to which those goals and objectives are met. Moreover, as a check on the appropriateness of those determinations, regular assessments of the child's overall development must be scheduled. If progress toward the pupil's individual goals and objectives appears to result in a slackening of progress or regression in other non-targeted areas of development, the relative importance of targeted concerns must be re-evaluated (Tallmadge, 1977). Of course, any assessments conducted to determine a child's specific needs or overall development must consider the problems of discrimination outlined earlier in this chapter. None of those conditions is likely to be met without careful planning and consideration, yet none of the reviewed programs made explicit reference to a systematic approach for identifying a pupil's greatest needs or for setting individual progress aims. Most programs did, however, monitor pupil progress on both targeted skills and overall development after placement (implying some concern for the criterion of "meaningful gains") and at least two programs (PRIDE and BAY) had explicit decision rules for determining when placements should be changed (implying that a priori standards for progress had been set).

Determining whether a pupil's progress in any one placement is adequate is a difficult task, but determining whether the pupil might progress better in an alternative placement can be even more difficult. Ideally, pupils would be exposed to a wide variety of program options in some systematic fashion and rates of progress obtained in each placement would be compared to ascertain which program appeared to be most appropriate. Aside from ethical concerns, however, practicalities obviate any serious consideration of such a system as an ongoing practice. As an alternative, pupil progress in existing programs (i.e., prior to referral) might be documented over a short period of time and then compared with progress obtained in the new placement. That would at least demonstrate the superiority of the new placement over the old. A few tracking systems have been developed which would facilitate such analyses (Note 9, Note 10), but they still represent more the exception than the rule. Initial screening and referral systems which assess pupils over more than one day might also be of assistance (e.g., Kunzelmann and Koenig, 1976), but they too are only infrequently employed. More commonly, information concerning various program options is analyzed to determine which placements are already serving similar children. Final placement is then made on a "best match" basis, presumably on the assumption that "homogeneous" grouping will lead to the greatest progress. Despite the fact that such an approach could run counter to mainstreaming and integration movements, the only program making reference to explicit criteria for program placement (LEARN) appeared to do just that. Three of the other programs made oblique reference to placement criteria, but none were stated clearly enough to permit a definite opinion concerning their validity.

Special considerations for system design. As more work has been done in the area of initial assessment than in any other type of assessment, more can be said about the manner in which such systems should be designed. Concerns center on four basic areas: (a) the selection of assessment targets, (b) assessment standards, (c) instrument characteristics, and (d) the use of explicit decision rules.

The _selection_ _of_ _assessment_ _targets_ is likely to influence the outcome of initial assessment decisions more than any other single factor. If the range of targets is too narrow, the child study team runs the risk of overlooking important factors which may influence the appropriateness of a placement. The proposed California guidelines (Clark, Note 8) offer one of the longest lists of possible targets, suggesting that each pupil be assessed with respect to: physical health, motor skills, sensory abilities, conceptual or cognitive development, prevocational or vocational skills, preacademic or academic skills, communication skills, social skills, self-care or independent living skills, emotional development, learning modality, and information processing skills. Although the degree to which the information gathering process in each area is formalized might differ considerably in accord with the perceived needs of the pupil (e.g., a child with no apparent problem other than a speech impairment might not be formally tested in all the areas listed above), each area should at least be considered by the child study team; whenever any doubt exists as to a possible need, formal assessments should be arranged. It is becoming all too apparent that many children have been misplaced or improperly served because relatively subtle handicapping conditions were overlooked (e.g., Hayden, Note 12; Hayden and Haring, 1974; McGee, Note 13; Patrusky, 1980). Most of the reviewed programs were suitably comprehensive in their approaches to initial assessments. PRIDE, in particular, formalized the assessment of a broad range of concerns. One program, on the other hand, despite the fact that it included a total of 41 different tests in its standard assessment battery, was notably unbalanced in its apparent concerns. Although the physical development of each pupil was assessed independently by a neurologist, a physical therapist, an occupational therapist and an "orthopedic specialist," there was no mention of any auditory or vision assessments whatsoever! Lengthy assessments are not necessarily comprehensive.

When dealing with the more severely handicapped, a truly comprehensive assessment might also need to be adaptive. Two basic forms of adaptations have been suggested. First, in cases where a pupil may not understand the directions used in traditional assessments, training can be provided to increase the probability of appropriate responding. Examples include operant audiology and vision assessments in which pupils are trained to respond to a variety of relevant stimuli (light or sound). Pupils thought to be functionally blind or deaf have, in many cases, demonstrated surprising capabilities with such approaches (e.g., Decker and Wilson, 1977; Fulton and Spradlin, 1971; Stolz and Wolf, 1969). Of the reviewed programs, BAY provided an excellent example of operant audiology and vision testing, and PRIDE indicated their use in at least some settings. None of the other programs reported the use of such approaches, despite the fact that in several cases the types of children involved would be likely to benefit.

The second form of adaptive assessment involves the redefinition of response modes. For example, the development of space-object relationship concepts is typically assessed by asking a child to put together a puzzle. If a pupil has no arms or legs, some alternative response mode would be sought to allow the expression of the same basic concept (e.g., staring to indicate which piece will fit into a particular part of the puzzle). The notion of adaptive, "critical function," assessments is not exactly new (c.f., Skinner, 1938), but it has only recently been explored in some depth (e.g., AAESPH, Note 11; White, 1980) and has only been incorporated in a few assessment instruments (e.g., The Uniform Performance Assessment System, Note 14; The Adaptive Performance Inventory, Note 15). It is not surprising, therefore, that none of the reviewed programs had, as yet, incorporated such procedures in their initial assessments. Many programs did make attempts to use assessment instruments which, while not adaptable *per se*, were at least already adapted for use with special populations (e.g., the Callier-Azusa, the AAMD Scales of Adaptive Behavior, the TARC Assessment Inventory for Retarded Children, and the Behavioral Characteristics Progression).

Once the basic assessment targets have been selected, attention should turn to a consideration of the *standards one will use in evaluating the results of assessment*. A great deal has already been written concerning the advisability of norm-referenced standards versus criterion-referenced standards (e.g., Jenkins and Pany, 1978; Salvia and Ysseldyke, 1974; Tallmadge, 1977; White and Haring, 1978; White and Haring, 1980), and any attempt to expand upon those discussions here would be redundant. Suffice it to say that the further away from any given norm a pupil moves, the less likely it is that a norm-referenced standard of expectancy will be appropriate. Norm-referenced tests are also likely to be more culturally or racially biased (Bailey and Harbin, 1980) and less useful than other forms of tests in identifying appropriate instructional targets (White and Haring, 1978). Despite those drawbacks, three of the five reviewed projects used one or more tests normed on the general population (e.g., the Peabody Picture Vocabulary Test) and two of the five projects used tests normed on special populations (e.g., TARC, the AAMD Adaptive Behavior Scales). Fortunately, perhaps, all projects also used one or more criterion-referenced standards, but most of those were not without faults of their own (c.f., White and Haring, 1978; Tallmadge, 1977).

Aside from the selection of a norm-or criterion-referenced standard of comparison per se, special educators are beginning to employ a wide range of qualifiers that place assessment results in a more meaningful context and provide additional information of value in actual program development. Wilcox (1979) provides an overview of assessment procedures designed not only to isolate the specific behaviors an individual pupil is able to emit, but the conditions under which those behaviors are most likely to occur as well (e.g., the types of instructional cues which are most effective, the materials most likely to evoke a response, the people who appear most effective, the types of consequences or reinforcers which are most likely to maintain appropriate performances and learning, and the general setting or situation in which responding is most likely to be appropriate). She concludes, however, that, "while answers to these questions have obvious instructional and programmatic importance, they are rarely systematically evaluated (p. 167)." Only one of the reviewed programs did, in fact, make explicit reference to the use of that type of qualifier in their own assessments (PRIDE), but at least one other program implied an interest in them by providing training to others in how to conduct such assessments (CALIF), and two other programs expressed a concern for those variables at the instructional level, if not at the initial assessment level of decision-making (BAY and LEARN).

Another type of qualifier beginning to gain some attention in assessment systems amounts to a specification of the degree to which a behavior appears to be a functional part of the pupil's repertoire. For example, White (1980) distinguishes among behaviors which a child "can do" (i.e., under ideal conditions the pupil will display the behavior), "will do" (if specifically requested), and "does do" (whenever it is appropriate during the natural course of events). Other approaches note the "level of assistance" required to evoke a response (e.g., full-physical assistance, physical prompts, extra verbal cues, no special assistance) (AAESPH, Note 11), or the proportion of times a pupil is able to respond correctly to repeated opportunities (e.g., 20%, 40% ...). As with the type of qualifiers discussed by Wilcox (1979), level of performance qualifiers can be invaluable in making the types of distinctions necessary for formulating meaningful goals and objectives and for deciding which placement will be most helpful in meeting those needs. Of the programs reviewed, four of the five did have some system to make use of performance qualifiers, but most were fairly gross and subjective (e.g., "performs task some of the time"). It might be argued that if qualifiers cannot be applied objectively, "all or nothing" criteria would be better.

In practice, the selection of assessment targets and standards usually follows blindly from the *selection of specific instruments*. If, for example, a program staff happens to like the Peabody Picture Vocabulary Test because it is widely known and easy to use, the content of that test determines at least some of the assessment targets, and the score-conversion tables of that test determine the standards of comparison. Ideally, however, the development of the system would proceed the other way around -- instrument selection or development would follow a more detailed analysis of desirable assessment targets and standards of comparison. If that order of events is followed, the range of options is likely to be narrowed considerably and only a few remaining criteria need to be applied to decide exactly which instrument will best meet the needs of the program and pupil.

The first criterion of interest is the relationship between the instrument and the assumptions underlying the model program itself. If, for example, the program is based on Piagetian theory, the assessment instruments used for program placement should be defensible with respect to that theory. Similarly, if the program follows a developmental model, developmental scales should be used; and if the program emphasizes ecological instruction, an instrument that attends to the ecology of the pupil's environment should be employed. The most notable example of model-instrument matching was provided by the CALIF, PRIDE, and LEARN projects, in which entire scales were developed in accordance with program philosophies. Instruments also appeared to be appropriately selected by the BAY project. Only one model program failed to provide clear rationales for instrument selection or development.

If an instrument appears to have a legitimate relationship to the assumptions upon which the model is based, attention should turn to a review of its basic metric qualities. Can it be administered reliably by the people who will conduct the assessment? Do the results of the assessment prove to be predictively valid in estimating how a pupil performs and under what conditions he or she might be able to make the best progress? Reliability and validity information should already be available for published instruments. It is important to remember, however, that the actual reliability and validity of an instrument will depend on how well it is used. Whenever possible, therefore, reliability checks and follow-up predictive validity checks should be conducted by the project itself on a regular basis. That is of special concern when a project develops its own test. Of the programs reviewed, two (LEARN and PRIDE) reported the results of reliability checks; one (BAY) stated that such checks were conducted, but did not report the results; and one relied solely on prepublished reliability figures. The last project was apparently unconcerned with reliability checks, even though they developed many of their own instruments and could not rely on prepublished information.

In contrast to the general concern for reliability, only one project (PRIDE) provided any data to suggest that one of their procedures was predictively valid. They checked the relationship between reaching criterion on individual tasks and the probability that the pupil would maintain or improve his or her performance after instruction was terminated. All remaining projects expressed an interest in predictive validity, but none provided any information which might address that concern.

Finally, instruments should be selected and used in a way which will increase the efficiency of the assessment process whenever possible. It is generally best to begin with instruments which assess a rather broad collection of assessment targets at a relatively superficial level. The results of those first assessments can then be used to select other instruments for more highly focused and detailed assessments in areas of special concern. Only one of the reviewed programs carefully detailed such a procedure (PRIDE). Many instruments were listed as possible choices in the assessment process, and specific decision rules were outlined for selecting the particular instruments which would be used with any given pupil. PRIDE also appeared to take the greatest care in dealing with redundancy or overlap among various assessment procedures and instruments. Some overlap is desirable (as a double-check on the accuracy of results), but too much overlap will greatly increase the costs of the assessment and needlessly delay decisions concerning the pupil. Only one project (again, PRIDE) provided actual data concerning the time required of any given person to conduct an initial assessment (20 minutes), but the procedures of most projects appeared to be quite reasonable. The one exception listed a total of 41 instruments, 19 of which were developed by the project, many of which appeared to overlap considerably, and without provision of guidelines to suggest how specific instruments might be selected for use with any given pupil. No actual data were provided by that project concerning the time required to complete an assessment, but it must have been considerable.

The last consideration in the development of an initial assessment system is whether *explicit decision rules* will be employed for choosing among placement alternatives. Some rules are likely to be imposed by state guidelines concerning the qualifications pupils must meet to be placed in various types of programs. Hopefully, however, programs would strive to improve upon those guidelines by developing procedures for predicting, on the basis of initial assessment information, exactly which program options will best serve the needs of the pupil. The basic strategies by which those guidelines might be developed and tested were discussed earlier in the section on screening. Only three programs among those reviewed had apparently attempted any such analysis. Most notable were the LEARN project (which developed a "criterion template" for matching the needs of pupils with the needs various programs were prepared to serve), and the PRIDE project (which tested the validity of its performance criterion through follow-up maintenance checks). Neither of those systems has been adequately validated, however, and there seems to be a paucity of well designed research in the literature concerning other possible approaches.

Where and How Should Instruction and Therapy Begin?

Overall purpose of the system. Taking the broad goals and objectives established by the child study team during the development of the pupil's IEP, it is the purpose of this phase in the assessment process to aid the teacher or therapist in deciding exactly where and how instruction should begin. A goal might be established, for example, to increase a pupil's self-help skills by teaching him or her to dress. Decisions still need to be made concerning the specific skill to be taught first (e.g., shoe-tying or buttoning), where within the sequence of skills to begin instruction (e.g., lacing or bow-making), and what types of cues and consequences to use (e.g., physical prompts versus extra verbal cues; praise versus small bits of food).

Overall test of the system. If the system for making initial instructional decisions is working, two criteria should be met: (a) the pupil will make meaningful progress during the initial phases on instruction; and (b) the pupil will make more progress with the selected instructional plan than he or she would have made with any other plan.

If pupil performances are monitored on a frequent basis, it should be relatively simple to ascertain whether any progress is occurring. It may be somewhat more difficult, however, to determine whether that progress is "reasonable." In response to that problem, a number of educators have suggested the use of a predetermined "progress-line," usually drawn right on the pupil's chart, which shows how much the pupil must improve from day-to-day in order to master a goal or objective within the time available. As long as the pupil's performances remain above that line, progress is deemed appropriate (Christie and McKenzie, 1974; Deno and Mirkin, 1977; White and Haring, 1980).

Determining whether a pupil might have made better progress if instruction had begun with another instructional target and/or if another instructional plan had been used is difficult. One can only guess, of course, what might actually have happened if instruction had begun differently; but there are ways in which data might be gathered to suggest at least whether rules for formulating initial instructional plans are valid. The simplest approach (but in some ways, the most time-consuming) is to analyze existing records retrospectively. All of the performance records collected during the previous year in a particular school could, for example, be analyzed to determine whether a relationship exists between initial assessment (or baseline) data and the success or failure of various types of programs. Using that procedure, rather detailed rules for selecting initial instructional strategies have been worked out with learning disabled children (e.g., White and Haring, 1980; White and Liberty, 1976) and severely handicapped children (e.g., Haring and Liberty, Note 4). In the latter case, Haring and Liberty (Note 4) were able to improve the probability of successful plan development from roughly 0.50 (i.e., only 50% of the plans worked when first tried) to over 0.83 (83% of the plans worked). Alternative approaches include the conduct of two or more programs concurrently, each with a slightly different plan (e.g., using different instructional cues or consequences) and then selecting the plan which produced the greatest progress for use in all curricular areas; or the multiple-probe technique (Horner and Baer, 1978), in which a pupil is tested on all steps in a program after achieving mastery at each step in the sequence. The multiple-probe technique provides information concerning the true need to provide instruction on all the steps originally specified for a task. Regardless of the approach used, the overall validation of any set of decision rules for the formulation of instructional or therapeutic plans rests in the demonstration that fewer initial plans fail when the rules are followed than when they are not followed.

Special considerations in system design. Due to the fact that this step in the assessment process represents a bridge between the work of the child study team and the classroom teacher or therapist, it presents several rather interesting concerns. For all intents and purposes, those concerns fall into two major areas: utilisation of initial assessment results, and discrimination of actual programming needs.

There is little doubt that many teachers do not utilise the results of initial assessments while formulating instructional plans (Alper, Note 2). That may be due to problems in the initial assessment itself or in the way teachers are trained or prepared to accept and interpret the results of those assessments.

Regardless of the cause, however, it is clearly an unacceptable condition. The IEP, which in itself should be a direct result of initial assessment, represents the collective opinion of all people directly concerned with the education of the pupil. By disregarding that opinion, the teacher certainly runs the risk of duplicating efforts (assuming that any assessments the teacher conducts yield the same results) or, more probably, of making basic decisions that are beyond his or her authority.

Several suggestions have already been reviewed for ensuring that the results of initial assessments are usable to the teacher, including the use of situational qualifiers (Wilcox, 1979), functional-level qualifiers (White, 1980) and multiple-day assessments to show rates of progress, as well as overall performance level in key areas of concern (Kunzelmann and Koenig, 1976). Holland (1980) also suggests the need for better communication among team members (see the discussion under "who" in the first section of this chapter) and appropriate inservice training for classroom staff. That is especially important in cases where information must be integrated across several disciplines. If, for example, a physical therapist truly expects a teacher to take into account certain of the pupil's physical disabilities, then the instructional implications of those disabilities must be specified in a clear and unambiguous manner. Regardless of how it is accomplished, it seems of paramount importance for the model program to demonstrate a clear and precise relationship between the results of initial assessments and the development of initial instructional plans. Two of the programs reviewed did specify procedures for facilitating that relationship (PRIDE and CALIF);

two others (BAY and LEARN) demonstrated that the relationship existed by presenting sample initial assessments and plans (but failed to explain how that relationship was achieved); and only one of the model programs failed to show any systematic relationship, simply saying that instructional plans were formulated as a result of "multiple inputs" -- implying, in fact, that the IEP might or might not be the governing factor.

The *discrimination of instructional need* is usually classified into two parts: (a) identifying the specific point in any given curriculum where instruction should begin; and (b) selecting the particular instructional strategies (e.g., cues, materials, consequences) which will best facilitate pupil learning and progress.

The most common method for identifying the point where instruction should begin is to pretest the pupil on all (or at least a wide range) of steps in the task sequence. Instruction then begins at the point where the pupil stops passing items. At least three of the reviewed model programs used some version of that approach (CALIF, LEARN, and PRIDE). In order for such assessments to be meaningful, some assurance must be provided that the sequence of items is hierarchical, i.e., arranged from least to most difficult (White and Haring, 1978). Most commercially published tests have carefully analyzed their scales to ensure this property, but many programs choose to develop their own scales by simply ordering items in what appears to be a "logical" sequence. In one such case, for example, the item "puts rings on stick" was placed before "strings beads." That seems reasonable. When actual pupil data were analyzed, however, more children missed the "stick" item than the "string" item! On closer inspection, it was determined that the sticks being used were of the tapered variety, so that if a pupil put the wrong ring on first, he or she could not correctly place the rest of the rings. Consequently, more pupils failed what was assumed to be the simpler item. When developing one's own scale, therefore, it is highly recommended that as much data be collected as possible and then subjected to some formal analysis (e.g., a Guttman Scalability Analysis or a Rasch Analysis).

A second method of identifying the point where instruction should begin is to select a smaller range of potential target areas and collect information concerning the pupil's performance in each area over a period of five to ten days. The resulting records will not only show the pupil's overall level of performance in each area, but his or her ability to learn each skill as well.

instruction is then centered on the most advanced skill area in which the pupil was able to demonstrate reasonable progress (White and Haring, 1980). A similar approach involves the assessment of a wide range of skill areas on only a single day and then the selection of that area in which the greatest deficit was noted. With multiple-day assessments, however, one frequently finds that a pupil may perform very poorly in a given area on the first day, but show rapid gains from day to day (White and Haring, 1980). One of the reviewed programs used the "greatest deficit" rule for instructional target selection (BAY); none of the programs appeared to base their initial instructional decisions on multiple-day assessments.

The selection of specific instructional strategies on the basis of performance data is somewhat less common than data-based selection of initial instructional targets. Nevertheless, at least two approaches to the problem appear to be gaining some popularity. The first approach, already reviewed in this chapter, attempts to identify those instructional variables (people, settings, cues, consequences, etc.) which appear generally more effective with any given pupil (Wilcox, 1979). The second approach tries to identify the particular "phase of learning" in which a pupil is currently developing and then to predict which types of instructional variables will be most important (Haring and Liberty, Note 4; White and Haring, 1980). For example, if a pupil is just beginning to acquire a skill, cues, prompts and extra instructions are likely to be more effective in promoting continued learning than more powerful reinforcers -- giving a child a "bigger M & M" is not likely to work all by itself if he or she simply does not know what to do. If a pupil has acquired most or all of a skill, on the other hand, and is simply trying to build fluency, drill is likely to be the most effective instructional strategy. Drill can be very boring, though, so the need for more powerful reinforcers may increase (White and Haring, 1980). Either approach (or, indeed, the combination of both) appear to be very powerful aids in the design of effective instructional programs, but only one of the model programs reviewed appeared to utilize such assessments in the development of initial instructional plans (PRIDE). The alternatives are the application of one set of procedures for all children, or a reliance on the "clinical judgment" of the teacher. The former might be justified if the model were highly directive in the teaching strategies allowed, but the latter approach (teacher judgment) is very likely to reduce the replicability of the program. It is suggested, therefore, that instructional options be identified as clearly as possible and that every attempt be made to find or develop rules for deciding which options should be tried first in any given situation.

Deciding When and How a Program Should Be Changed

Overall purpose of the system. Regardless of the care with which initial programs are designed and implemented, it is unlikely that any single instructional plan will remain effective or appropriate throughout the entire year. It is the purpose of this system, therefore, to monitor each pupil's performances to determine exactly when and how his or her program should be modified to facilitate continued progress.

Overall tests of the system. The criteria by which this step in the assessment process might be evaluated are essentially the same as those presented for developing initial instructional plans (i.e., reasonable rates of progress in the selected programs; higher rates of progress than would be achieved with other programs). Rather than being concerned solely with the initial response of the pupil to an instructional plan, however, attention must now turn to assessment procedures which will allow the teacher to detect the need for changes in programs which might have at one time been effective and appropriate, but which no longer are. Two questions in particular need to be answered: (a) are problems in previously effective programs being detected and remediated in a timely and efficient manner; and (b) is the pupil given the opportunity to move as rapidly through the curriculum as he or she is capable of moving?

Possible methods for identifying the initial success of an instructional program were discussed in the section on "where and how instruction should begin." In order to determine the timelines of program modifications, however, it will be necessary to establish criteria for determining when instructional programs *cease* to be effective and then ascertain the number of times those criteria were met or exceeded (i.e., the need for program modification arose) without appropriate intervention by the teacher. Several criteria have been suggested, including that point at which the pupil has been making no progress for three successive days; that point at which the median performance for a given week is lower than the preceding week; getting seven incorrect responses in a row; or whenever a pupil has gone more than a prespecified number of days without reaching his or her performance aim. There are at least two possible problems with many of those criteria, however.

First, criteria for deciding when a program has ceased to be effective are often selected for purely arbitrary reasons and may have little or no bearing on whether a pupil would or would not have actually met his or her ultimate performance aim on time if the program had been left alone. Ideally, criteria would be derived by comparing and contrasting various patterns of pupil performance associated with eventual program success or failure; and then the resultant rules would be applied to other programs to see whether they can actually predict eventual outcome. Examples of such analyses can be found in White and Liberty (1976) and White and Haring (1980).

Secondly, many criteria do not represent "closed systems," that is, it might be possible for a pupil never to reach his performance aim and still not meet the criteria for program failure. For example, a pupil might never get better than 50% correct on a program (well below his performance aim) but also never get seven errors in a row (the criterion for program failure). For program-failure criteria to be effective, there must only be two possible outcomes -- the pupil must eventually reach his or her performance aim, or eventually fulfill the criteria for program failure.

There are at least two approaches for determining whether a pupil is being given the opportunity to progress through the curriculum as rapidly as possible (i.e., the second question concerning system effectiveness which must be answered). First, if the curriculum in question can be broken down into a reasonably small number of steps, the multiple-probe technique suggested by Horner and Baer (1978) can be employed. After reaching mastery on any given step in the curriculum, the pupil is tested on all remaining steps to determine whether they all actually still need to be taught. In order for that technique to be appropriate, it must be possible to complete the assessment of all steps in the curriculum (or task of interest) within a reasonably short period. A second approach, employed in the Great Falls School District of Montana (Note 10), involves the specification of annual goals in a manner which allows for their direct assessment on a monthly basis. For example, if a fifth grade learning disabled pupil is reading at the third grade level, an annual goal might be established to have him or her reading at the fifth grade level before the end of the year. Progress toward that goal can be measured directly each month by assessing his or her performance in an actual fifth grade reader. At first the performance may be poor (e.g., many words may be skipped), but it is likely that some measurable performance will result. Actual instruction can then be directed at any one or more subskills which the teacher feels will help the pupil (e.g., reading in a third grade reader, practicing vocabulary lists) and the impact of those efforts can be measured directly in terms of improved monthly performances on the annual goal skill (reading from a fifth grade reader). If, at some point, the pupil is able to begin progressing rapidly on the annual goal skill without further work on the intermediate steps, that should become apparent. If, on the other hand, work on intermediate steps is not really moving the pupil closer to attaining the eventual goal, that too should become apparent.

Other methods for determining whether a pupil is progressing at a reasonable rate through the curriculum have been devised (e.g., Clark, Note 8; White and Haring, 1976). Regardless of the method employed, however, several conditions must be met. If the multiple-probe technique or some related approach is used, there must be a clear understanding of the steps comprising the curriculum (i.e., intermediate objectives). If the terminal-goal-probe approach is used, there must be a clear understanding of what that terminal goal actually entails. In either case, specific and objective performance criteria must be established for ascertaining when a goal or objective has been "mastered." Ideally, such criteria would be empirically derived by finding the level of performance which a pupil must reach in order to maintain and utilize a skill without further instruction (White and Haring, 1980). Unfortunately, such analyses are quite rare. One of the reviewed model programs (PRIDE) did conduct follow-up studies to determine whether pupils who had met criteria on various skills maintained their performances, but, of the remaining four programs, only two (BAY and LEARN) expressed concern for the functional relevance of their criteria.

Special considerations in system design. Most of the basic considerations for the design of systems to aid teachers in making timely program improvement decisions were actually covered in the preceding discussion. In devising a system to check whether timely program improvement decisions are being made, one is very likely to establish the guidelines which teachers can employ to make those decisions. There are, however, a few additional points which might be made and a few which could bear repeating.

First, virtually all of the formal systems designed to assist teachers in making timely and appropriate program improvement decisions require a frequent and objective assessment of pupil performances. Without such assessments, programming errors are not likely to be detected until they reach major proportions or, conversely, teachers may react prematurely to small setbacks in pupil progress that would best be ignored. The actual frequency with which assessment should be conducted is still a matter of debate. Most systems are based on the assumption of daily assessments (e.g., Baldwin, Fredericks, and Brodsky, 1973; White and Haring, 1980) while others may recommend formal assessment on a weekly basis (Sailor, Note 16) and still others have recommended assessments as infrequent as once every six months (e.g., Adams, 1975). Within the constraints outlined below, this author would suggest that assessments be made as frequently as possible.

Second, it has been suggested (Lindsley, Note 17) that a major determinant of the efficiency with which decisions can be made is the uniformity of the procedures one employs. If, for example, one collects the same basic type of data with every instructional program, graphs pupil progress on the same basic type of chart, and uses the same basic strategies for analyzing all data, it will be far easier to build a history of experience and expectancies than if different procedures are used with each individual program. That history will, in turn, help the teacher to detect patterns of acceptable and unacceptable progress far more easily than would otherwise be possible. Although, to my knowledge, no definitive study has ever been completed on the advantages of uniformity, my personal experience would tend to support those notions. It is suggested, therefore, that any procedures employed in the classroom be selected or devised in a manner that facilitates their uniform application across a wide range of programs.

Third, if teachers are to be effective in making timely and appropriate program improvement decisions, it is vital that the procedures they employ be as efficient as possible. A case was discussed earlier in this chapter where teachers were not able to effectively employ a procedure that took 20 seconds per program, but were able to employ a procedure that took only 2 or 3 seconds. Seemingly small differences in the time required to make decisions can make a big difference. Ideally, of course, the application of useful program decision rules will actually reduce the time a teacher must spend with any given program; and, fortunately, at least a few procedures have demonstrated the ability to do just that (e.g., Bohannon, Note 6).

Finally, evidence is slowly accumulating to support the notion that precise, closed-system program improvement decision rules will dramatically improve the probability of eventual program success (e.g., Bohannon, Note 6; Deno and Mirkin, 1977; Haring and Liberty, Note 4; Mirkin, Note 7). Indeed, simply collecting precise pupil performance information, without explicit rules for actually using those data, may be a detriment in at least some cases (Mirkin, Note 7). It is strongly recommended, therefore, that the possibility of such rules be carefully investigated in every model program.

Of the reviewed projects, at least two (BAY and PRIDE) depended heavily on daily assessments of pupil progress. BAY, PRIDE, and LEARN also expressed criteria for skill mastery in fairly clear, objective terms. Of those three, however, only PRIDE attempted to verify the validity of its performance aims empirically. BAY and PRIDE also shared rather explicit decision rules for determining when a pupil should advance from one step in the curriculum to the next, but none of the programs reported rules which teachers might use for deciding if and when a program should be remediated to improve pupil progress.

Should the Pupil's Placement Be Changed?

The decision to change a pupil's placement is essentially a reinvestigation of the question discussed earlier in this chapter concerning the pupil's initial acceptance into a program. It is presented here as a separate question only to emphasize three points.

First, the process of assessment is a never-ending cycle. Each part of the assessment process should lead directly into another -- screening into general needs assessment, general needs assessment into placement, placement into program development, program development into program refinement, and program refinement back into general needs assessment. It is true, of course, that program development in the classroom should be directly related to the pupil's IEP. But it is also true that each step in the sequence should be related to every other step, which brings us to the next point I wish to make.

The first annual review of a pupil's program by the child study team should not be a simple replay of the initial IEP development meeting. At the very least, more experience will have been gained with the pupil and, hopefully, a great deal more information will be available concerning the conditions under which the pupil is able to learn and progress. Special arrangements must be made to organize and analyze that information in a systematic way.

Finally, while the first child study team may have been convened to decide whether the pupil should be placed in a special education program, all subsequent meetings should be convened to determine whether it is now possible to move the pupil back into a less restrictive program or out of special education altogether. The criteria for making that move should certainly be as explicit as any established for an annual goal or intermediate objective, and while it may be necessary to reanalyze those criteria to determine whether they are still appropriate (i.e., to ensure that conditions in other possible placements have not changed radically since the criteria were originally set), the focus of all our efforts should be to achieve those ends.

Unfortunately, only two of the reviewed programs specified guidelines for making reintegration decisions (BAY and PRIDE). BAY, quite admirably, also had specific procedures for assessing the eventual success of pupils after they left their program and for correcting any problems which might have arisen. Due to the nature of the other programs and the services they were designed to provide, one might argue that reintegration decisions were beyond their immediate concern or scope. It would have been far preferred, however, that any such rationale be explicitly expressed, rather than implied.

STATE OF THE ART

"State of the art" is, unfortunately, an all too apt title to be using for a summative analysis of assessment in special education today. Assessment, at least as practiced in the majority of model programs, is indeed an art. There are those that do it very well, and those that do it very poorly. There is even a fairly large number who do not do it at all, at least as defined in the beginning of this chapter. Virtually all of the factors reviewed in the first section of this chapter have been considered by someone -- the various steps involved in assessment; a concern for the "what's, who's, when's, and how's"; analyses of system reliabilities and validities with respect to various decision-making processes. Several examples of those efforts have already been referenced; and, indeed, quite a few of the concerns raised in this chapter were adequately addressed by the model programs reviewed. Still, there remain several major problems in assessment as it is most commonly practiced.

First, most programs have adopted an orientation toward objective pupil performance data of some sort, but only a few programs have truly tried to relate those data to some meaningful decision-making process. In some cases, perhaps, a program may be forced by antiquated laws to gather information which is of essentially no use, but, for the most part, it is strongly suggested that programs collect only that information for which they have a very definite use. From the standpoint of child assessment, of course, that means that it should be possible to describe exactly how the information will be used to make action-oriented decisions concerning individual pupil programs.

Second, there seems to be a basic imbalance in the child assessment systems employed by various programs. In some cases the imbalance is reflected in an over-emphasis on one or a few aspects of pupil development (e.g., using 41 tests of physical development and none for concept or academic skill development), while in other cases the imbalance lies in the particular type of assessment decisions emphasized (e.g., 41 tests for initial assessment, but no procedures for monitoring pupil progress after a program has been implemented). A model program may have been funded to concentrate on only one or a few aspects of a pupil's program, but the responsibility to meet all of the pupil's needs still exists. Even if certain types of child assessment are of only peripheral interest to a model program, it should still be made clear how those needs are being met.

Third, in part because of the imbalance in assessment concerns demonstrated by many programs, the procedures employed for child assessment frequently appear unwieldy and impractical. They may not actually be impractical, but without evidence to the contrary, there is often no other conclusion one can draw. It would be wise, therefore, if more model programs began to gather data concerning the time actually required to implement various procedures, and to describe the skills or training required to implement the procedures successfully.

Fourth, there seems to be an explosion of activity in the area of test development. Virtually every program ever reviewed by this author has at least one instrument which it developed independently. In many cases, due to the unique approach being explored by the model program, the need for a more appropriate instrument can be justified. At least one of two problems is likely to arise, however. First, the most common, the program staff may have little or no appreciation for the procedures one should apply when developing a new assessment instrument. As a result, many programs end up using some procedure or instrument which appears to answer the questions they wish to address but, in fact, may be systematically distorting reality. The same may be said of any other part of the assessment process as well -- other forms of information gathering, ways of organizing information, ways of analyzing information, and ways of formulating data-based decision rules. On the other side of the coin, this author has frequently had the unsettling experience of encountering program personnel who have an extensive background in formal test construction methodology, but who have had little or no experience with the types of pupils or phenomena they wish to test. The rules which may apply for developing a good norm-referenced test may not apply to the development of an instrument to be used with multiply handicapped children. For example, it is common in formal test construction to discard any item that does not discriminate between extremes in overall score. One test-builder applied that procedure and discarded the item "eats with a spoon" because it did not discriminate between high-functioning and low-functioning children in the program (equal numbers of each passed the item). Looking at the target population a little more carefully revealed that the high-functioning children who failed the item happened to be crippled, while the low-functioning children who passed the item tended to be severely mentally retarded but not crippled. More to the point, the purpose of the assessment instrument was supposedly to measure "overall level of independent functioning," and one might well argue that eating with a spoon is an important skill to consider. In short, it seems that many of the instruments being developed by model programs are either content-valid (they make sense), but construction poor (they do not work), or vice versa. It is hoped that some way to combine the best of both worlds can be found.

SUMMARY

The role of child assessment in the conduct of any educational program cannot be underestimated. For model programs, however, child assessment systems do more than provide a means for reacting in a timely and appropriate manner to the individual needs of each pupil. They facilitate model replication by providing an explicit framework for making the decisions critical to the faithful implementation of the model.

In order to be assured of reliable and valid results in child assessment, several factors need to be considered: (a) the general purpose of the assessment, (b) the people who must be involved, (c) time-lines for completing each assessment, and (d) the specific procedures to be used for gathering information, organizing it in an interpretable form, analyzing it, and using it to make specific choices.

The specific decisions which will warrant formal child assessment systems in any given program will depend upon legal constraints or mandates, the existence of options among which choices must or can be made, the probable impact of decisions on the success or failure of a pupil's program, the assumptions upon which the model was developed, and the confidence one has that procedures for consistently reaching appropriate decisions can actually be specified. For most programs, child assessment systems should at least be considered for deciding whether a pupil should be referred to special education, whether a pupil should be accepted into special education, where to actually place the pupil, how instruction should begin, when and how instruction should be modified, and when and how the pupil's placement should be changed.

The trend, over the past few decades, has been encouragingly toward more frequent, more precise, and more systematic child assessment. Problems do remain to be solved before the goal of appropriate child assessment systems in every program can be achieved, but the technology to resolve those problems exists. It seems now to be more a matter of applying the technology we have, integrating results more systematically across specific program areas, and expanding our abilities to translate the results of our efforts into practical, disseminable packages.

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CURRICULA FOR THE SEVERELY HANDICAPPED: COMPONENTS AND EVALUATION CRITERIA

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In an effort to systematize, qualify, and quantify the development of curricula, the U.S. Office of Special Education has funded approximately 59 projects to develop and demonstrate effective curricula for severely/profoundly handicapped (SPH) learners (Wilcox, 1979). The most critical question one must answer in selection of a curriculum is invariably one of effectiveness. This chapter addresses factors that should be incorporated into a curriculum if it is to be effective in meeting the needs of SPH learners. This chapter also describes important educational considerations for severely handicapped persons, criteria and questions that should be considered in the formulation of an instrument to evaluate curricula, and finally an illustration of the application of an instrument to evaluate selected curricula.

The initial challenge in writing a chapter on curriculum is definition. Essentially, a curriculum defines "what" is taught and may organize content behaviors into units of inspection. For example, math curriculum may be defined as encompassing quantity-related concepts and can be organized into instructional units such as one-to-one correspondence, counting, addition, subtraction, and division. Curricula for SPH (severely/profoundly handicapped) should delineate specific skills to teach. Those skills should encompass areas that: (a) increase the learner's functional interactions with their environments, and (b) lead to increased independent functioning in integrated community, vocational, recreational, and/or domestic living environments.

As delineated by Burke and Cohen (1977), curricula for SPH learners should encompass skill domains such as motor, sensorimotor/cognitive, communication, socialization, recreation/leisure, functional academics, vocational, cognitive, self-help, domestic living, community living, and sex education. For each instructional unit there should be a precise articulation of the skills encompassed. Curricula for SPH learners can be all-encompassing and articulate all the skills that should be taught, or they may only cover one or two of the skill domains listed above.

A review of readily available curricula reveals that, in addition to articulating what skills to teach, the vast majority of curricula describe how to carry out one or more of the following educationally relevant functions: (a) assess learners' skill levels; (b) sequence skill instruction; (c) select-long and short-term objectives; (d) select instructional tasks and materials; (e) teach the skills; (f) monitor learner progress; and (g) summarize overall learner functioning level. Such curricula attempt to make educational programming more efficient through integrating assessment, objective selection, instructional procedures, and measurement into one organized package that makes it unnecessary for the educator to use one instrument for assessment, a second instrument (e.g., the curriculum) for determining appropriate objectives, and then search a variety of resources to derive appropriate tasks and materials, measurement procedures, and instructional procedures.

Subsequent sections of this chapter will indicate that curriculum should be designed to facilitate the IEP process. That is, curriculum should form the basis of assessment to determine overall learner functioning levels. The curriculum-based assessment should lead directly to long-and short-term objectives that are contained in the curriculum. In addition, the curriculum should suggest instructional procedures, tasks, and materials; ways to adapt the curriculum to alternative learner input and output modes; summative formative evaluation procedures. Curricula that provide such procedures will more readily meet the current needs of the field. However, an instrument does not have to meet all these criteria to be considered a curriculum. In fact, some educators argue that curriculum which meet all the above criteria are too specific and cookbookish. Factors that should be considered when developing, selecting, or evaluating curricula are discussed below, and the readers should select the curriculum factors which best meet their needs.

SCOPE AND VALIDITY CONSIDERATIONS IN CURRICULUM DEVELOPMENT AND EVALUATION

When developing, selecting, or evaluating any curriculum, its scope and validity must be addressed. Scope generally defines the user population and content areas for which the curriculum is intended, while validity refers to how well the curriculum does what it purports to do.

Curriculum Scope

Scope refers to the range of skills a curriculum encompasses. There are at least four dimensions which should be considered when attending to curriculum scope: (a) variety of skill domains; (b) range of skills within each domain; (c) handicapping conditions encompassed; and (d) chronological age range of learners.

Variety of skill domains. Some curricula for SPH learners cover only one skill domain, such as motor, communication, self-care, or vocational. Other curricula cover many but not all essential skill domains, while others attempt to cover all relevant skill domains. The scope of skill domains covered by a curriculum is of paramount importance because the grouping of skills into domains is relatively arbitrary and skill domains are significantly intertwined. For instance, some curricula classify such skills as dressing and grooming as social skills, yet others classify them as self-care or self-help skills. Poor understanding of how skills are grouped in a curriculum can lead to the selection of inappropriate curriculum or to difficulties in locating skills within a given curriculum.

Curricula that do not encompass all essential domains and/or do not cross-reference domains can present at least two problems: (a) only the skills covered by the domains of the curriculum will be attended to and other essential skills will be neglected; and (b) in order to cover all essential skills, several curricula have to be patched together. For example, a communication, motor, and self-care curriculum may have to be patched together. Problems occur in combining various curricula: (a) the curricula may have incompatible formats and terminology; and (b) some skills from various curriculum domains may not readily relate to skill interrelationships. For example, when acquiring a self-care task such as brushing teeth, the learner should also be acquiring such interrelated skills as communication (e.g., comprehending and expressing the labels for toothpaste, brush, sink, etc.) and motor (e.g., grasp, release, directed reaching). One coordinated and cross-referenced curriculum would identify related skills to facilitate teaching and assessing skills from various domains concurrently. The use of isolated domains from several curricula or even from one curriculum makes such natural and concurrent teaching of skills across domains difficult. It appears that one curriculum that includes, coordinates, and cross-references the assessment and instruction of all skill domains would be more efficient.

Range of handicapping conditions covered. Programs and classes for SPH learners often emcompass learners who are motorically, visually, and/or auditorially handicapped. Often, however curricula either do not make provisions for motorically, visually, and/or auditorially handicapped learners, or are categorized and attend only to one type of handicap. Thus, the educator may have to select different curricula or substantially adapt curricula for various handicapping conditions. Because of the limited scope of handicapping conditions encompassed by one curriculum, the educator may again have to use three to four different curricula for one program or classroom.

Age range of learners covered. Some curricula for SPH learners are developed for young learners (0-6) as well as older learners (6-21), although such age ranges do not necessarily exist in actual programs or classrooms. Again, the educator must combine several curricula to meet learner needs and to ensure a coherent program across age-range and handicapping conditions.

Curriculum Validity

Curriculum validity is concerned with what the curriculum purports to do and how well it does it. Validity can also be concerned with how well the curriculum meets consumer needs. A curriculum may do what it purports to do well -- without meeting consumer needs. Validity in terms of meeting consumer needs mandates that the curriculum developer assess these needs during the curriculum development process and then construct the curriculum to meet them. (In addition, the curriculum developer should review available curricula to determine whether curricula that do meet consumer needs are already available, and, if so, should justify the need to expend the time and resources necessary to continue with the curriculum development effort). Three basic types of validity are: (a) construct, (b) content, and (c) criterion-related.

Construct validity. Curricula should provide a rationale for the selection and sequencing of curriculum content. Construct validity refers to how consistent the content of a curriculum is with this rationale. For instance, a curriculum developed and sequenced on the basis of Piagetian constructs can be evaluated in relation to how consistent the content is with Piagetian theory.

Existing skill sequences or curricula for the severely handicapped generally use either a "normal" developmental approach or a remedial approach. A developmental approach typically assumes that the best way to order instruction for SPH learners is to use the sequence in which "normal" children learn. Such sequences are usually considered to be relatively invariant across children and to be a universal constant underlying a learner's development.

Practitioners trained in the developmental approach often assume that learners move through various developmental levels, and that each level is prerequisite for achievement of skills at the next higher level.

Within a remedial (Guess, Horner, Utley, Holvoet, Maxon, Tucker, and Warren, 1978) or an "ecological analysis-task analytic approach," skill sequences are derived from an analysis of the skills individuals should acquire to function as independently as possible in out-of-school and post-school environments. Practitioners who use a remedial approach do not select skills to teach SPH learners on the basis of the order of skills in a developmental sequence but, rather, on the basis of skills that will improve the learner's ability to interact with the environment (Guess, et al., 1978).

When using a remedial approach, the practitioner may initially analyse the skills learners should perform to function more independently in selected integrated community, home, recreational, and vocational environments. These skills are then separated into component skills which are ordered from simple to complex in a skill sequence. Within this approach, the analysis of the skills necessary to function within selected environments is labeled ecological analysis and the derivation of skill sequences is called task analysis. The remedial approach thus concentrates on identifying the order in which certain skills will lead to rapid improvement in SPH learners' ability to interact within the environment, rather than the order in which nonhandicapped learners acquire skills. York and Williams (1977) described relative advantages and disadvantages of these curriculum approaches (Table 1).

The primary advantages of the remedial approach are that it is longitudinal and ensures that training activities are not misdirected. However, developmental data should not be ignored when using this approach. For example, an ecological analysis may indicate that a learner should be able to imitate, walk, swallow, chew, etc., to function more independently in community environments. Developmental data are extremely useful in determining the component skills involved in such behaviors, and the sequence in which the skills are typically acquired should be considered when deriving a task analysis or skills sequence for teaching the skills. The utilization of developmental and remedial approaches to maximize the advantages and minimize the disadvantages of each is not a new idea (Bricker, Dennison, and Bricker, 1976). Currently, there is no strong knowledge base to determine whether one basic form of curriculum is better than another. However, curricula can be evaluated in relation to how

Table 1

Selected Advantages and Disadvantages of Developmental and Remedial Approaches

Developmental Approach	Remedial Approach
1. Easy to explain and widely accepted 2. Theoretical base for the sequence 3. Extensive literature on normal development is available 4. Normal sequences of development begin at nearly zero (0) skill level and progress to independent functioning 5. A normal developmental base is most often the only model that puts enough expertise together to develop comprehensive service delivery 6. A learner's progress through a normal developmental sequence may serve to diagnose motor and sensory impairments 7. Generally it recognizes the importance of teaching interrelated skills	1. Easy to explain 2. Insures that sequences are directly based upon competencies required by individuals to function within selected settings 3. Skill sequences are anchored at the upper end to some required and functional skill 4. Skill sequences are readily translated into functional alternatives such as wheelchairs and communication boards 5. Assumes that a learner's failure to progress through a sequence is due to the instructional program and/or curricula sequencing rather than the learner's low developmental functioning level
1. There is a sparsity of normal developmental data in a variety of curricula areas 2. Variability in normal development often precludes the formulation of systematic easy to hard skill sequences 3. The appropriateness of sequences based upon normal development for SPH is often questioned since these learners have already failed to progress through them 4. Normal development does not necessarily represent a teaching sequence 5. Basing skill sequences upon normal development does not provide for instruction on functional alternatives such as wheelchairs and communication boards 6. Sequences based on normal development may not attend to the age appropriateness of tasks 7. Often assumes that a learner's failure to progress is due to low developmental functioning level or lack of readiness skills	1. Remedial skill sequences may be nonexistent and have to be developed 2. Task analysis does not necessarily represent a teaching sequence 3. Ecological and task analyses may be so individualized that it is not applicable to other learning environments and may actually inhibit generalization

well they adhere to and apply the constructs upon which they are based. Usually, construct validity can be determined through review of the curriculum by a panel of experts.

Content validity. As used here, content validity involves the systematic examination of the curriculum to determine whether it encompasses the appropriate skills, instructional procedures, measurement procedures, etc., for the intended population. For example, a communication curriculum for SPH learners could be examined to determine whether it encompasses appropriate communication skills.

A curriculum developer could use two basic procedures to evaluate content validity:

1. A panel of experts could review the curriculum.
2. An empirical study could be conducted. Conducting an empirical study usually involves field-testing the curriculum. During the field-test, data are systematically collected on such dimensions of the curriculum as range of skills covered and the appropriateness of the suggested instructional procedures, measurement procedures, etc. The field-test data are then used to revise the curriculum before a final product is produced.

Criterion-related validity. As used here, this type of validity indicates whether a learner's acquisition of selected curriculum skills can be used to predict the learner's performance in other environments. The ultimate goal in the education of SPH learners should be to increase their independent functioning in integrated community, domestic living, recreational, and vocational environments. Curricula should reflect this goal. For example, a self-care curriculum would have criterion-related validity if, as a result of using it, learners demonstrated increased independence in self-care skills such as eating and dressing at home and in restaurants. Similarly, for vocational curriculum to have criterion-related validity, their use should result in an increase in the learner's abilities to engage in significantly remunerative work in competitive or sheltered employment.

Three primary considerations in selecting, developing, or using curricula are: (a) curricula should be based upon longitudinal skill sequences; (b) they should not misdirect training activities by either focusing upon tasks that are not directly related to more independent functioning in community, recreational, home, and vocational settings or by not training tasks that are essential; and (c) they should make no assumptions about the learner's potential to acquire more independent living skills.

Issues raised in this section that address scope and validity considerations lead to the following criteria for evaluating curricula:

1. Who is the intended user population?
    - Intended age level?
    - Handicapping conditions addressed?

2. What curricular areas are included?

3. How many different skill domains are included?

4. How are skills cross-referenced across multiple domains?

5. Are functional applications of skills assessed/trained?

6. Is a theoretical basis for the program addressed?

7. Are field-test data supplied with the curriculum?

SKILL SEQUENCES AS A BASIS OF CURRICULA

What Are Skill Sequences?

Learners with severe handicaps typically do not readily learn from casual and unplanned exposure to instructional materials. One way to organize and systematize instruction for the SPH learner is to delineate skill sequences that lead from current functioning level to the acquisition of selected behavior objectives. Skill sequences usually involve cumulative skill-building, that is, early skills in the sequence usually facilitate the acquisition of later skills. For example, a skill sequence for teaching a learner to count to 10 could be:

1. Teach learner to count to 1

2. Teach learner to count to 2

3. Teach learner to count to 3

4. Teach learner to count to 4

5. Teach learner to count to 5

6. Teach learner to count to 6

7. Teach learner to count to 7

8. Teach learner to count to 8

9. Teach learner to count to 9

10. Teach learner to count to 10

A skill sequence for teaching rolling could be:

1. Turns from side to back

2. Turns from back to side

3. Rolls from stomach to back

4. Rolls from back to stomach

The practitioner who uses a cumulative skill-building approach does not arbitrarily choose to teach a skill, such as counting to 5 or rolling back to stomach, but selects it because the learner has mastered preceding skills that facilitate learning of the next skill in the sequence.

Longitudinal skill sequences should form the basis of all curricula. They are hierarchies or progressions of behaviors that advance from zero or very limited skills to independent functioning in skill areas such as motor, communication, self-care, mobility, recreation, and so on.

> Similar to the mathematical concept of a number line, skills are ordered along a continuum of increasing complexity. However, skill sequences are comprised of chains of behaviors instead of numbers. Just as a number line can be infinitely divided to find another number between two numbers, a skill sequence can be divided to find another skill or subskill. (York and Williams, 1977, p. 19).

Assessing and placing each learner within such a skill sequence allows the formation of a basic map of where learners are and where they should go. Skill sequences provide a framework for assessment and ordering instruction but are not recipes. That is, the exact sequence in which skills are taught must be adapted to meet individual learner needs.

Some of the advantages of a skill sequence approach as delineated by York and Williams (1977) are listed below.

1. Assessments based upon skill sequences identify what skills learners do and do not perform and what skills may be taught next. Such descriptions provide more instructionally relevant information for purposes of delineating instructional objectives and grouping learners than such labels as severely handicapped, autistic, and profoundly retarded or describing learners in terms of IQ or development age.

2. The use of skill sequences eliminates the need for a concept of "readiness." The teacher never waits for a learner to be ready to learn a given skill, but begins to teach the prerequisite skills specified in the skill sequence.

3. Use of skill sequences facilitates the individualization of instruction. Instructional programs are individually tailored for each learner based upon his or her placement within the skill sequences. Learners are then allowed to progress through these sequences based upon their individual rates of achievement.

4. The use of skill sequences facilitates the coordination of assessment, the selection of instructional objectives, and program evaluation. These functions can be viewed as separate uses of one common skill sequence. Instead of using one system for screening, another for determining instructional objectives, and a third for program evaluation, these particular functions can be tied together into a well-integrated and coordinated system. That is, determining learner's functioning levels in a skill sequence screens those in need of services, delineates instructional objectives, and evaluates the effectiveness of a program based upon the learner's progress through the sequence.

5. The use of skill sequences helps to minimize the deleterious effects of learner transfers to other classrooms and personnel turnover. Programs based

upon longitudinal skill sequences have a continuity independent of the people who are currently involved as instructors or administrators. Teachers receiving learners or replacing other teachers know exactly where the learner was and where instruction should begin. In addition, the use of long-term skill sequences gives the program stability and direction, and it is not necessary for teachers to haphazardly pick skills for instruction based upon some prevailing fad or subjective opinion.

6. The use of skill sequences can facilitate the development of more efficient curricula. That is, if instructors monitor learner performance, they can obtain data which indicates the order in which skills are most readily acquired and which skills must be broken into finer sequences of component skills. A cycle of constructing the skill sequence, monitoring learner performance, revising the sequence, etc., should lead to more efficient and valid curricula. It is only through such efforts that we can progress from "normal" developmental sequences, logically derived notions of sequences and laboratory research to empirically valid curricula. Although skill sequences form a common basis for curriculum, there are diverse methods for generating skill sequences and each has advantages and disadvantages. (pp. 19-20)

Vertical and Horizontal Approaches to Skill Sequencing

Many curricula for SPH learners use a vertical skill sequencing approach within each skill domain encompassed by the curriculum. A vertical skill sequencing approach is typically based upon the assumption that skills can be divided into domains such as motor, communication, self-care, social, functional academics, etc. A separate simple-to-complex/easy-to-hard skill sequence is then derived for each domain. Instruction progresses through each domain and no attempt is made to coordinate instruction across domains. Such an approach is depicted in Table 2. However, it has been well documented that skills within and across skill domains are usually learned concurrently by the handicapped learner's normally developing peers. For example, within the motor or sensorimotor domains, the skills of visual tracking, palmar grasp, and rolling may be learned concurrently. At the same time, related skills from other domains may be

Table 2

Vertical Skill Sequencing Approach

Motor Skill	Self-Care Skill	Social Skill	Pre-Academic Skill
A	A	A	A
B	B	B	B
C	C	C	C
D	D	D	D
E	E	E	E

learned, such as spoon-feeding (self-care domain), eye contact (social domain), and matching to sample (communication or cognitive domain). Horizontal sequencing as used here involves concurrently teaching skills within and across domains and introducing new skills only after facilitator skills within and across domains have been acquired. Table 3 illustrates how the scope and sequence of a curriculum which attends to horizontal sequencing may be depicted.

Each number in the chart represents a skill in one of the subdomains. The chart indicates that the first two skills from the visual, head control, and grasping sub-domains may be taught concurrently. It also indicates that the first skill of each of these sub-domains is typically acquired before the first reaching skill is introduced. In addition, the chart indicates which skills across domains may be taught concurrently and which skills across domains are typically acquired prior to introducing a new skill.

A manifestation of using a pure vertical sequencing approach in curriculum design is that educators may end up implementing programs to teach isolated skills and often not attend to teaching coordinated skills through tasks which require the use of functionally related skills. For example, a separate program may be designed to teach grasping (e.g., picking up blocks), reaching (e.g., reaching for blocks), and still another program may be designed to teach eating with a spoon and taking off an overhead pullover shirt. However, eating with a spoon and taking off a pullover shirt both involve reaching and grasping. Thus, two self-care programs could be implemented to teach the five skills. In addition, comprehension and expression of the labels for eating utensils, clothing items, and following basic directions (e.g., picking up spoon, pick up the shirt) could be introduced in the spoon eating and undressing tasks to concurrently teach communication/language skills (for further discussion, see Somerton-Fair and Turner, 1978). The horizontal sequencing approach can result in the learner's acquiring many skills through a limited number of functional tasks and ensures that the learner can coordinate the use of isolated skills such as grasping, reaching, and visually tracking in the performance of functional tasks.

Typically, curricula for SPH learners delineate one task through which skills should be assessed and taught. Once learners have mastered the task, they are moved on vertically to instruction on the next skill in the sequence. This approach is problematic because SPH learners should demonstrate skills across many functional tasks before mastery can be assumed. In addition, a

Table 3
Horizontal Sequencing within and Across Skill Domains

Domains	Skills									
MOTOR										
Visual	1	2	3	4	5	6				
Rolling			1	2	3	4				
Head control	1	2	3	4						
Reaching		1	2	3	4	5	6			
Grasping	1	2	3	4						
Sitting			1	2	3	4				
(Etc.)										
COMMUNICATION										
Responds to sounds	1	2	3	4						
Match to sample			1	2	3	4	5			
Concepts						1	2	3		
Comprehends labels								1	2	3
Expresses object labels								1	2	3
SELF-CARE										
Eating			1	2	3	4	5			
Undressing				1	2	3	4	5		
Dressing						1	2	3	4	
(Etc.)										

few learners may be unable to progress to the next higher skill in the sequence due to physical, sensory, or cognitive deficits. Independent functioning may be increased by teaching such learners to apply the learned skill across a greater number of functional tasks. For instance, concentration may be on teaching the learner to indicate "want more" across different activities in addition to or prior to teaching higher level skills.

In addition to assessing and teaching skills within and across domains concurrently, horizontal programming can involve teaching learners to apply skills across many functional tasks before progressing to the next higher skill in the sequence. Table 4 illustrates this concept.

In summary, horizontal programming is an important dimension of curricula and programming for SPH learners. It is a common construct in curriculum design and should be attended to in the selection and development of curricula for the SPH.

SKILL FUNCTIONALITY AND SEQUENCING

Skill Functionality

As defined herein, a skill or response is functional when it:

1. Produces an immediate consequence for the learner;

2. Is reinforcing;

3. Is natural to the learner's interaction with socioecological or prosthetic environments;

4. Has long-range benefits and extended use during the life span of the learner.

The skills that comprise curricula should be selected and/or adapted to meet these criteria. Table 5 delineates skills, as well as functional and nonfunctional tasks through which the skills could be assessed and taught.

Table 5 illustrates that one skill can be taught or assessed through many tasks. Often curricula delineate a few tasks through which skills can be assessed and taught without attending to the task functionality or age-appropriateness. A key principle is that skills are not functional until learners can apply the skills in the performance of daily living activities.

Table 4

Horizontal Programming: Teaching the Application of Skills Across Many Functional Tasks

SKILL	TASKS			
Pincher grasp	Picks up raisin	Picks up coin	Picks up small candies	Grasps button-ponies grasp
Indicates "wants more" by gesturing	Indicates wants more milk	Indicates wants more music	Indicates wants more ride	Indicates wants more rocking
Signs object names	Signs "ball"	Signs "truck"	Signs "spoon"	Signs "___"
Reaches	Reaches for food	Reaches for toys	Reaches for self-care items	Reaches for people

Table 5

Selected Relatively Functional and Nonfunctional Tasks for Assessing and Teaching Selected Skills

Skills	Nonfunctional Tasks	Functional Tasks
1. Pulls up pants	1. Pulls up pants when cued by the teacher in classroom	1a. Pulls up pants after swimming b. Pulls up pants after toilet c. Pulls up pants while dressing in the morning
2. Labels "balls"	2. Labels balls when asked "What's this" in the classroom	2a. Asks for "ball" at recess b. Asks for a ball at home
3. Brushes teeth	3. Brushes teeth at the classroom work table when cued by teacher	3a. Brushes teeth after snack b. Brushes teeth after lunch c. Brushes teeth before bed d. Brushes teeth before going out on a heavy date
4. Sorts objects/makes sets of objects	4. Sorts triangles and squares into separate sets	4a. Sorts silverware and dishes into separate bins after washing b. Sorts clothing into separate drawers when putting away laundry
5. One-to-one correspondence	5. Aligns felt apples and trees in 1-to-1 correspondence	5a. Gives each place setting a plate when setting the table b. Gives each classmate a cookie at snack time
6. Object-permanence	6. Finds objects hidden behind screens at classroom worktable	6a. Finds articles of misplaced clothing

This principle has profound implications for assessment and instructional programming. It mandates that the learner's ability to perform skills across many tasks of daily living be assessed and taught. Commercially available assessment tools and curricula usually do not assess and teach the functional applications of skills in tasks of daily living. Thus, even after acquiring many skills listed in a curriculum guide, learners may not be able to function more independently in community environments. The functional applications of those skills were neither assessed nor taught. Curricula should delineate age-appropriate functional tasks of daily living through which skills can be assessed and taught.

One method for testing the appropriateness of an objective is to translate it into a life function that will increase independence in community home living, recreational, and vocational settings. Objectives which cannot be translated into such life functions should be considered for deletion from a curriculum. Table 6 depicts the translation of skills into life functions.

Functional Alternatives

SPH learners encompass an extremely heterogeneous population which includes learners with motoric and sensory impairments. A major challange is to develop curricula that can be individualized and adapted to meet diverse learner needs. Typically, curriculum content focuses upon such skills as walking and talking without directly attending to the functions of the skill and alternative ways to fulfill that function. For curricula to be adaptable to SPH learners, they should address selection and instruction on functional alternatives. Table 7 illustrates the process of translating skills into the function they perform and shows examples of alternative ways to accomplish those same functions.

Let us say the target skill is using single-word utterances. Generally the behavior indicated by normal development for carrying out the function would be emphasized. By definition, it would be the most typical and appropriate to the learner's chronological age and generally the least restrictive. If it is determined that the learner does not currently have the requisite skills to vocalize, an augmentative method must be chosen which is the most functional, normal, age-appropriate, and least restrictive.

One caution must be made in the delineation of functional alternatives. It may seem as if one functional alternative must be selected. In the area of communication this is clearly not

Table 6

Translating Skills Into Life Functions

Skill	Function
Walking	Mobility in space to increase independence in all activities
Tying shoes	Fastening shoes to increase independence in self-care
Brushing teeth	Oral hygiene to increase independence in self-care
Verbally labeling objects and actions	Expressing wants and needs; describing the here and now
Reading a recipe book	Preparing meals to increase independence in home-living

Table 7

Translating Skills Into Functional Alternatives

Skills	Functional Alternatives			
Walking	Cane	Crutches	Walker	Wheelchair
Verbally label objects	Communication board - Scanning - Direct selector - Encoding	Gestures	Formal signing	
Tie shoes	Wear loafers	Buckle shoes	Velco closures	

the case, and often the learner should be simultaneously acquiring skills in each of several communicative modalities. Comparative progress in each of these areas would then be used as data to select the best augmentative system. Functional alternatives must be considered from the onset of a learner's individualized plan for services but this selection of functional alternatives should not be made in a rushed fashion or in the absence of data. Neither must the selection of one alternative always be made over another. In the area of communication, it is possible for the learner to vocalize and sign simultaneously or vocalize while operating a communication board.

In summary, a primary consideration in developing and evaluating curricula is skill and task functionality. In addition, because SPH learners constitute such a diverse population, curricula should attend to functional alternatives that facilitate adaptation of curriculum content to individual learner needs.

Issues raised in this section on skill sequences lead to the following evaluative criteria:

1. Are skills part of a longitudinal sequence?
    - Is vertical skill sequencing addressed?
    - Is horizontal skill sequencing addressed?

2. Are functional alternatives for links in a skill sequence provided?

3. Are a variety of instructional tasks listed or described?

CURRICULA AND THE IEP

Public Law 94-142 assures that all handicapped learners be provided with special education services designed to meet their unique needs. The aspect of P.L. 94-142 that most directly affects the educator is participation in the formulation of an Individual Educational Program (IEP) for each handicapped child. The IEP includes the delineation of:

1. Learner's current level of functioning

2. Long-term (annual) goals

3. Short-term objectives

4. Statement of educational services provided with specific invervention strategies

5. Specification of extent of participation in regular programs

6. Timelines for initiation/completion of services

7. Statement of objective criteria and evaluation procedures

8. Summative/formative procedures for tracking learner progress.

While curricula can in no way be totally prescriptive in the formulation of an IEP, the organization of curricula should readily allow for adaptation to meet requirements of the IEP. This section will address the utilization of curriculum for the development of service components of the IEP.

Establishing Present Level of Performance

Haring (1977, p. 77) made the following distinction between measurement, assessment and evaluation:

Measurement	A dynamic measure of behavior which charts performance, its rate, quality or quantity over time...
Assessment	Measurement of an individual's performance at any one time to determine his status in cumulative skill or knowledge.
Evaluation	Measurement of an entire...program after it has been completed in order to assess its effectiveness.

The distinction is important in that it stresses the importance of ongoing assessment (formative) as well as end-of-program (summative) evaluation of learner behavior. Additionally, the term "evaluation" stresses the importance of scrutinizing the teaching program and teacher performance as well as learner performance.

Prior to developing the first step in an IEP, it is necessary to determine the eligibility of a learner for special education. An initial interview may be the first contact made between the educator, the potential pupil, and the pupil's parents or parent representatives. During this interview, the observed overall functioning level of the learner in specific areas is assessed. In addition, areas requiring interdisciplinary expertise for assessment or development of the learner's educational plan can be noted.

Once eligibility is established, the process of determining the learner's present level of performance begins. An efficient process would begin by gathering information previously provided by persons with an in-depth knowledge of the pupil, such as a parent, parent representatives, or teacher. Analysis of this initial information should provide the instructional staff with a rough indication of the learner's strengths and weaknesses. Next, an interview, utilizing curricular assessment, should indicate which objectives in a skill sequence should be given priority for assessment and whether special expertise is necessary for in-depth assessment in selected areas, such as motor or communication. Follow-up interviews may be conducted to determine the pupil's performance level on objectives within the skill sequence system.

This procedure of initial assessment may provide more accurate and complete information on a learner's skills than may be obtained when complete assessment is done by a person who is not acquainted with the pupil (this is particularly true with very young or handicapped populations). An initial assessment incorporating follow-up interviews also immediately involves parents or parent representatives in the development of the learner's educational program. Interview assessments provide an opportunity for parent and educator to discuss appropriate educational objectives for the pupil and to develop a vehicle to facilitate continuity between home and school on pupil progress.

Format for administration. After hypotheses have been formed about the learner's functioning, an in-depth assessment with the learner is possible. One cannot rely solely upon one method or procedure to obtain the required information about the learner's behavior. Kaplan (1964) warned against the use of an assessment paradigm simply because it is available. He refers to the inflexible overuse of an assessment device as "law of the instrument:"

> ...give a boy a small hammer and he will find that everything he encounters needs pounding (p. 284).

The majority of assessment devices available for SPH learners are limited in format. This is unfortunate, as the more options in assessment format offered, the better the clarity of the information obtained.

In an attempt to weigh the respective pros and cons of elicited and observational assessment, Reichle and Yoder (1976) examined eight profoundly mentally retarded children functioning developmentally below 12 months of age. During elicited assessments, the evaluator systematically cues specific responses, whereas observational assessment involves observing the learner in situations where the evaluator does not systematically cue responses. Reichle and Yoder selected three behaviors to assess: motor imitation, auditory localization along a horizontal plan, and object permanency (sensorimotor Stage 3). All children received a total of five hours of observational assessment, as well as a separate 20-trial elicitation task for each of the behaviors under consideration. Results suggested that in five of the eight children, the *most frequently observed behaviors were not the* most frequently *elicited behaviors*. When the observational data were viewed in terms of successes per number of observable discriminative stimuli, the agreement between responses to naturalistic versus experimentally administered S^D's ranged from .52 to .67. Viewed in terms of correct responses/total trials, four children emitted higher percentages of appropriate responses during observational assessment. The interpretation of these data have led to the belief that there is no *single* method that will necessarily result in a valid assessment of many skills critical to educational progress for SPH children. Miller (1977) suggested that the use of elicited assessment procedures is warranted when specific aspects of behavior are to be analyzed and their frequency of occurrence in naturalistic settings is limited. This rationale was based on the fact that elicitation procedures are generally less time-consuming than observational assessment. Our philosophy is that there is *no one single decision rule in the selection of a strategy to be used in the implementation of an assessment protocol*.

Several issues must be addressed in the discussion of the initial assessment that are pertinent regardless of whether an elicited and/or an observational format is selected for assessment. These issues include standardization and selection of assessment items.

Standardization of assessment items. Frequently, school districts require that the assessment devices used must be standardized tools. Although standardization is generally equated with a reliable and valid instrument, no data have ever been presented to suggest that severely handicapped learners group around a normal distribution. Moreover, since most tests were standardized with normally developing children as subjects, their advantage in the assessment of severely handicapped learners is open to serious question.

Selection of assessment items. Those items included in an assessment protocol are customarily referred to as criterion and noncriterion referenced items. Criterion referenced assessments are defined as those evaluative instruments that examine behaviors that are potential instructional items contained within the curriculum. Noncriterion referenced assessments, on the other hand, represent those evaluative instruments that either: (a) do not directly examine behaviors that are to be addressed in the instructional program, or (b) do not reflect the recommended scope and sequence of behaviors to be trained.

Often when a noncriterion referenced device is used, the instructional staff must translate the test item into functional skills to train, as is shown on Table 8. (See Thompson and Rainforth, 1978, for other examples).

Sequencing assessment items. A second problem inherent in noncriterion referenced approaches is the use of a noncriterion referenced assessment as if it were criterion referenced. Noncriterion tests (particularly if standardized) do not represent a compilation of tasks necessarily separated by equal intervals of difficulty. Only those items that prove to be highly discriminative are included in many noncriterion referenced assessments. The result is that a graded easy-to-hard sequence will be disrupted. This limitation can result in difficulty as assessment results are translated into instructional objectives (see Table 9).

Our intent is not to indict the use of noncriterion assessment items; our criticism regards the misuse of noncriterion-related instruments.

The literature currently available in the area of initial assessment of learner behavior would suggest that:

1. Options in the format of the assessment instrument may facilitate application to heterogeneous SPH populations;

Table 8
Functional Alternatives to Traditional Assessment Tasks

Assessment Task	Functional Alternative
Laterally pinch tongue depressor	Pick up toothbrush/toothpaste
Pick up one object then another	Hold toothpaste/remove cap
Hold and manipulate two objects simultaneously	Put toothpaste on brush

Table 9
Examples of Complete and Incomplete Skill Sequences

Partial Easy-to-Hard Sequence	More Complete Easy-to-Hard Sequence
? ⬆ Tracks across midline on vertical plane	Tracks midline to periphery on horizontal plane Tracks periphery to midline on horizontal plane Tracks across midline on horizontal plane Tracks midline to periphery on vertical plane Tracks across midline on vertical plane
? ⬆ Localizes to rear	Localizes on horizontal plane Localizes on vertical plane Localizes to rear

2. Standardized assessments should not be selected over other assessment instruments simply because they are standardized;

3. Whenever possible, assessment items should relate directly to critical skills in the learner's environment;

4 If a skill sequence omits a number of items in the easy-to-hard sequence, it is critical that the educator recognize these omissions.

Long-Term Goals and Short-Term Objectives

The role of the writer of generic curriculum is somewhat different from the role of the individual selecting/adapting an instructional objective for an individual learner. In generating curricula, it is necessary to write the smallest possible chunks of learner behavior. It is not particularly relevant for the generator of curricula to attend to annual goals, per se, because expectations for a learner's rate of acquisition are highly variable. It is the individual educator's responsibility to select the unit of behavior(s) most representative of any given learner's anticipated progress over the course of months up to a year. Once the behaviors are selected, it is essential that they be written as specific short-term objectives. The writing of the instructional objective must meet three criteria in order to comply with the requirements of the IEP process: (a) a clear and objective specification of conditions under which the behavior is to be observed; (b) a description of the behavior to be learned; and (c) the criteria at which the behavior must be performed when it has been mastered.

Unless each of these components is clearly specified, it will be extremely difficult to implement a given curriculum objective and maintain a reliable system of formative assessment. The discussion that follows will address the relationship between the short-term objective and the specification of instructional procedures for acquisition, maintenance, and generalization.

Time-lines for Initiation/Completion of Services

The formulation of time-lines for service delivery would appear, at first glance, to be a topic that could be treated briefly. Reichle (1979) examined over 30 individualized educational plans designed for SPH learners between the chronological ages of 3 and 19 who were residents of a state institution. Time-lines reflecting the date of program implementation and completion were found, in the majority of instances, to be totally inconsistent with previously available information on the learner's history of skill acquisition. Examples included in Table 10 demonstrate time-line discrepancies.

Often teachers are led to believe that a curriculum can deliver more than it really can. For example, some curricula purport capacity to train a set of 10 object labels in 10 hours of training (Carrier and Peak, 1976). The 10-hours specification may have meant hundreds of trials spaced in a very short amount of time. For example, individuals often cite the success of Lovaas' curriculum. Lovaas (1966) trained language 8 hours a day with learners maintained in a 24-hour environment. Obviously, the manner in which a curriculum is implemented is just as important as the content itself.

A second problem that may account for overly optimistic timelines is the myth that published curricula are totally successful. Few authors of curricula dwell on their failures. Consequently, the teacher is led to believe that a curriculum will be successful if implemented according to specifications. Guess, Sailor, and Baer (1978) report that over 30% of the learners enrolled in their vocal imitation program fail. More realistic data on results of commercial curricula might have a positive effect on teacher expectations for both learners and curricula.

The establishment of timelines leading to the initiation and completion of services depends upon the characteristics of the individual learner, the nature of the behavior or class of behaviors being established, and the quantity and distribution of training trials.

Instructional Strategies

The IEP process requires that instructional strategies be specified. Rarely, however, is this information expanded to the extent that would make it useful during the intervention process. The best instructional strategy information sufficient for replication found in the subset of 30 IEP's discussed earlier included: (a) general instructional approach (e.g., behavioral modification), (b) number of other learners included in the activity (e.g., small group, one-to-one), (c) potential schedules of reinforcement (e.g., FR-2, CRF), and (d) persons responsible for service delivery. Unfortunately, this information is not sufficient to allow for the replication of a planned instructional activity.

Table 10

Excerpts From SPH Learner's IEP

Previous Learning History				Project Short-Term Objective			
Time	Condition	Behavior	Criteria	Condition	Behavior	Criteria	Time
12 months	Given verbal cue "where" Array of cups & spoons	Points to cup	75% accur. 3 of 4 consecutive sessions	Given verbal cue "where" • fork • knife • ball • cup • shoe Array of 5 objects	Learner will point to item requested	100% accur. during 3 of 4 consecutive sessions	1 month
14 months	Given verbal cue "say"/	Imitates/ ba/	90% accur. during 3 of 4 sessions	Given cue "say"/ba/	Learner will say/	Criteria 100% accur. during 3 of 4 consecutive sessions	1 month

In order to meet minimal professional standards, as much instructional information as possible must be placed in the conditions section of the short-term objective. An additional document outlining teaching procedures should be formulated for each learner's program and should be referenced in the instructional strategy section of the IEP. Components of educational programs specifying both teacher and learner behavior are included in many publications (Williams, 1975; Williams, Brown, and Certo, 1975; Williams and York, 1978). The following components are typically indicated as necessary to a comprehensive educational program for SPH learners:

1. Terminal objective (What to teach)
2. Rationale (Why teach that objective)
3. Learner (Who to teach: Learner characteristics)
4. Materials (What to teach with)
5. Instructional arrangement (Where to teach)
6. Instructional procedures (How to teach)
7. Consequences for instruction
    a. Reinforcement
    b. Error correction
    c. Sequential description of teaching processes (flow chart)
8. Data collection system
9. Generalization/self-initiation
10. Maintenance

Information concerning each of these components is readily available and Appendix A (Vogelsberg, Anderson, Berger, Haselden, Mitwell, Schmidt, Skowron, and Ulett, 1980) offers an example of an educational program for an SPH learner with sections defining the components and examples of each component.

The majority of these components are well known to educators of the SPH learner. There are, however, specific components that are typically not given adequate attention when arranging instructional programs.

Most teachers have become well acquainted with the sequencing of a task to be trained into a chain of small component parts, or task analysis. Less frequently do they attend to a method of organizing instructional programs that occurs when teaching a concept. Learning a concept requires learning a set of criteria that can be applied to a variety of positive instances. Becker, Englemann, and Thomas (1975) have delineated a variety of strategies to teach concepts through the use of tasks requiring conditional discriminations, and these are summarized below.

Organizing the instructional setting. Once the instructional staff has determined the relative need for task analysis and concept analysis, further delineation of the instructional strategy may proceed. There are two approaches situated at either end of a continuum of instructional strategies. These include stimulation and training. Stimulation refers to a careful arrangement of antecedent events in order to maximize the learner's opportunity to respond. Training, on the other hand, refers to a careful arrangement of antecedents *as well as consequences* that are response dependent. The literature is replete with reports of successful use of these training paradigms across a number of curricular domains.

Most instances of successful stimulation programs have been documented during the first six years of life (usually with learners not classified as severely handicapped). The most successful stimulation programs have also been paired with more formal training exercises conducted either in a center base or closely monitored in the home (Horiwitz and Paden, 1969). Several critical questions regarding a more generalized use of stimulation programming will challenge the developers of curricula for stimulation programs. These include:

1. Does stimulation lead to significant changes across the life span; and

2. Are stimulation procedures of sufficient intensity to impact on severely handicapped learners?

At the outset of the discussion of intervention strategies, we suggested that to propose a total dichotomy between stimulation and training would be misleading. There are a number of curricula available that suggest using overt, highly structured sessions paired with occasional more naturalistic training trials throughout the course of the day (Hohman, Banet, and

Weikart, 1979; McDonald, 1978; Vincent, Branston, and Salisbury, 1977). Another label that refers to training extended to the naturalistic environment is incidental teaching.

Incidental teaching. Incidental teaching opportunities are of two varieties: learner initiated and teacher initiated. In the first, the child initiates the training trial. Let us suppose that a learner has been participating in a communication program designed to teach the child to initiate a request for assistance. Let us further suppose that on a cold day, the child in the process of putting on a snowsuit gets his/her zipper stuck. The child has just created an S^D for a trial of requesting assistance. In this particular instance, it is the responsibility of the teacher to seize upon this child-initiated S^D. In a training program, the teacher would observe the child's behavior and emit one of the consequences shown in Table 11.

The second method of incidental teaching occurs when, from the beginning, the teacher triggered the S^D. Consider the same learner who is being taught to initiate requests for desired objects. While it is impossible to indicate at exactly what point the teacher's cue becomes overt, as opposed to incidental, consider the following hierarchy (Table 12).

It is generally accepted that incidental teaching represents the best method of ensuring that learner interest is considered and that functional skills are being established. The primary disadvantage of incidental teaching centers on the enormous responsibility placed on the instructional staff to recognize, initiate, or respond consistently to incidental opportunities for instruction.

Issues raised in this section on curriculum and the IEP lend themselves to the following evaluation criteria:

1. Are prerequisite skills identified?

2. Are procedures provided for assessment/verification of learner progress?

3. Are procedures provided for initial assessment of skills to be taught?

4. Are data collection procedures provided for monitoring progress?

5. Are specific instructional objectives specified?

6. Are defined sequences for instructional objectives presented in task analysis format?

7. Are concepts analyzed in clearly specifiable procedures?

8. Are recommended materials included or inexpensively available?

9. Are a variety of training formats presented or suggested (e.g., stimulation, incidental teaching)?

10. Are instructional procedures specified that include?
    - Error correction
    - Reinforcement
    - Antecedent cueing

Table 11

Child Behavior and Teacher Consequence in an Incidental Teaching Paradigm

Child Behavior	Teacher Consequence
Approaches teacher and emits target request	provides assistance
Approaches teacher but fails to emit target request	reinforces approach provides verbal prompt ↘ administers least restrictive prompt hierarchy { gestural prompt ↓ model
Fails to approach teacher	teacher moves closer to learner ↓ continue moving closer ↓ verbal prompt

Table 12

Hierarchy of Teacher Induced Antecedent Events

Teacher Antecedents		Learner Position
1. Presents identified S^{R+} and asks what do you want 2. Presents identified S^{R+} in clearly visible location but out of learner's reach	Formal Session	Seated across from teacher
3. During a task designed to teach a behavior other than object request - teacher provides desired object as in 2		
4. Teacher places object and makes self overtly available	In vivo	Learner positioned to see desired object brought into room and placed out of reach
5. Teacher places object and makes self less available further away from child and object in another room		
6. Teacher places object and makes self available as in No. 5		Learner does not observe placement of object

GENERALIZATION AND MAINTENANCE

Traditionally, generalization and maintenance have been viewed as "things" that are dealt with after mastery. Our experience and the data available, however, suggest that we have not been particularly effective in our efforts to ensure the maintenance and generalization of behaviors.

Reichle (1979) sampled thirty IEP's written for learners between the ages of 3 and 19 over an 8-month period. Only 7 of the 30 documents specified objectives that related to maintenance or generalization of established behaviors. This finding would be consistent with the hypothesis that many teachers are reinforced by increasing or decreasing behaviors, rather than by enhancing maintenance and generalization of behaviors. There is a clear need for curricular aids that translate core curriculum objectives into functional activities across a variety of tasks that occur throughout the learner's day.

Generalization

Incidental teaching allows for the consideration of a generalization variable of self-initiation that is not commonly addressed in educational programs. Since most behaviors taught in the majority of curricula are accomplished with the child responding to verbal or motor S^D's of another person, it is important to determine that the learned behavior may be emitted as a result of more subtle S^D's. Let us suppose, for example, that the teacher sets up the following learning opportunity.

Antecedent	Learner Behavior
* Red apple placed on table out of learner's reach	* Learner self-initiates request for apple
* No verbal antecedent is provided	

In the preceding example, the learner emitted the target response in the absence of a verbal cue. Some individuals would refer to the learner's behavior as a generalized response. The literature, however, suggests that delayed learners have a propensity not to self-initiate behavior learned in a responding paradigm (Leonard and Fey, in press; Watson, 1977). One method to help ensure that the learner will both initiate and respond is to introduce both verbal cues and nonverbal cues prior to mastery. This latter notion simply makes initiations part of the criterion behavior to be learned.

Ten or 15 years ago, there was such an emphasis on instructional technology that skill functionality was neglected. An extremely detrimental aspect of nonfunctional tasks as instructional vehicles was that many steps were needed to seek out functional applications of the skill taught. For example, the child who mastered identical match to sample by using color squares has to generalize to match the colors of socks. In the preceding instance, generalization from color squares to socks was an unnecessary programmatic step. The example below reiterates the importance of skill functionality aspects of content validity. The better the match between skill functionality and curricular tasks, the lower the risk of requiring an unnecessary step in the generalization process (see Table 13).

The literature describing normal development suggests that opportunities must be provided for generalization prior to mastery. Without these opportunities, the learner will have been denied valuable learning experiences.

Maintenance

Maintaining a learner's performance may occur: (a) from the conclusion of programming to some specifiable point in the future, (b) from one programming period to another, or (c) within trials of a programming period. Maintenance has traditionally been associated with learner and teacher behavior subsequent to the acquisition of a behavior that is scrutinized before as well as after acquisition.

Often teachers operate with the belief that once a skill/behavior is acquired it is permanently in the learner's repertoire. This assumption cannot be made when working with SPH learners. Care must be taken so that periodic assessments on acquired behaviors may be implemented to assure that the learner's behavior has not deteriorated since acquisition. If deterioration has taken place, systematic procedures must be implemented to re-establish lost behavior.

Maintenance between programming periods. Assuring maintenance between programming periods requires particular care in data monitoring. Data systems included in a given curriculum must provide mechanisms to monitor progress from session to session. The status of the behavior must be systematically compared to environmental factors that might radically influence performance. One predominant environmental factor is the learner's inability to maintain performance over sessions (often involving the learner's health status and corresponding absences from sessions). One set of learner data, showing two different methods of labeling

Table 13

Training Environment vs. National Environment

Training Environment		Ultimate Environment
Taught to ask for change from attendant	Unnecessary Generalization	No attendant; change machine available
Taught to use machine to provide individual packets of detergent		No dispensing machine available
Taught to put particular amount of detergent in front loader industrial 24-lb. washer		Top loader requiring significantly less detergent
Taught to use coin operated dryer		No dryers available; must travel to second laundromat (or) hang up clothes

sessions, is displayed in Figure 1. Data set A would tend to suggest that the learner is fading at the current programmatic step being implemented. Data set B, however, provides supporting evidence that the behavior is deteriorating because of inconsistencies in the conduct of training sessions. The above is one simple example of cautions that curriculum developers must issue to the naive user of curriculum.

Maintenance within trials of a programming period. With many early developing skills, such as auditory localization and visual tracking, the literature has demonstrated the propensity for the child to habituate (Eisenberg, 1978). Normal developmental literature suggests, for example, that with a three-month old, one is likely to obtain 10-12 auditory localizations prior to habituation (Eisenberg, 1978; Eisenberg, Griffin, Coursin, and Hunter, 1964). This example suggests that, even in normally developing populations, behavior will not necessarily be maintained over an extremely long period.

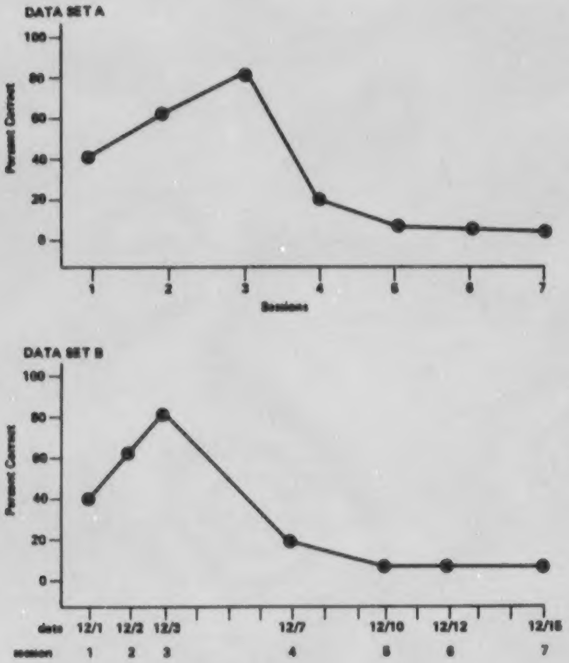
An alternative is a system which invokes a number of training sessions spaced throughout the day. For example:

10 trials	8 a.m.
10 trials	11 a.m.
10 trials	2 p.m.
10 trials	4 p.m.

This system uses thresholds of habituation for behaviors that are exhibited by a normally developing population and makes those thresholds the basis for the initial selection of a number of trials per session.

Reichle and Yoder (1976) demonstrated that this technique of distributed trials served to facilitate short-term maintenance in SPH learners. They formed two groups of learners of similar developmental level and chronological age. One group received 30 consecutive trials during a single training period. The second group received 10 trials during each of 3 separate sessions separated by approximately 2 hours. Several findings were significant. Those learners who received 10 trials at a time had significantly more success within the first 5 trials of a session than those who received large trial blocks. Although neither group showed significant differences in trials to criteria, the 10-trials-at-a-time group maintained the behavior significantly better than the 30-trials-at-a-time group. Although this evidence is tentative, there is more need on the part of curriculum developers to explore those aspects of the intervention strategy that effect the administration of trials through the learner's day.

FIGURE 1
Learner Process Displayed Using Abscissa Increments



Developers of curricula have, for the most part, not directed users to this body of information and have not incorporated this information into specification of session length/duration. The implications of using the above approach are often a potential source of assistance for the classroom teacher in the management of the classroom environment.

Issues in this section that address maintenance and generalization lead to the following evaluative criteria:

1. Are there monitoring systems and procedures to ensure maintenance?

2. Are there procedures to ensure student-initiated performance of skills?

3. Are procedures available to assist in the establishment of generalized behavior?

FIELD USE OF A CURRICULUM EVALUATION CHECKLIST

Vogelsberg and Wilcox (1977) proposed the use of a curriculum evaluation checklist that could be used to compare prospective curricula in any given domain of interest. Table 14 displays a modification of the Vogelsberg-Wilcox checklist that includes categories addressing all evaluation variables described previously in the chapter.

The checklist was used to evaluate a variety of curricula representing skill domains that included: (a) self-help, (b) recreation/leisure, (c) communication, (d) functional academics, (e) home management, and (f) vocational/ community survival. Eighteen curricula were chosen and are listed in Table 15. While the results of this evaluation represent little more than a non-empirical expert appraisal, the results illustrate some of the strengths and weaknesses of available curricula and point out variables that future curriculum efforts may address.

Each curriculum was read in its entirety by the authors. Subsequent to the reading, the evaluation checklist was completed and readers were free to re-examine curricula to search for evidence pertinent to checklist items. Each evaluative item was scored as the item pertained to assessment and/or intervention. Evaluative items were scored in the following manner.

yes	Curriculum reviewed adequately addresses this item.
no	Curriculum reviewed does not address this item.
partial	Curriculum reviewed addresses this item indirectly or incompletely.
not applicable	Curriculum reviewed does not address item because the variable is not germaine to the curricular area addressed.

A minimum of three curricula were reviewed in each area, with the exception of the home living domain where two curricula were reviewed. Pooled data for each assessment item are presented in Table 16. As indicated in Table 16, items 19, 20, 23, and 24 were not scored because evaluations of the items were too subjective and/or not enough information was provided within the curricula to score them.

Longitudinal Skill Sequences

Virtually all curricula reviewed were criterion-referenced and lead the user directly from components of initial assessment to instructional objectives. The sequencing of instructional objectives was handled in a number of different ways. Approximately 40 percent of the curricula reviewed relied exclusively on vertical (easy-to-hard) skill sequences. As one would predict, the practice was most prevalent in areas where normal developmental sequences were not readily available (e.g., vocational, home management). Recreation and leisure curricula reviewed were particularly adept at providing a combination of both horizontal and vertical skills sequences. Review of data from the functional academic area was particularly puzzling. In this curriculum domain, horizontal sequencing was not addressed even though the functional academics area contains numerous sets of interrelated sub-domains.

Prerequisite Skills

Approximately half of the curricula reviewed addressed prerequisite skills. Curricula that identified prerequisite skills usually provided a method for assessing those skills. Domains particularly weak in this area included recreation/

Table 14
Curriculum Evaluation Checklist

Curricular Area Evaluated: ____________________
Curricular Areas Included: ____________________
____
Curriculum Title: ____________________
Curriculum Components: ____________________
____
Author(s): ____________________
Program/School: ____________________

Curriculum Source: ( ) Commercial
( ) Unpublished
Publisher: ____________________
Address: ____________________
City, State, Zip: ____________________
Telephone: ____________________
Catalogue and Page : ____________________
Cost: ____________________

Intended Population
- ( ) non-handicapped
- ( ) mild
- ( ) moderate
- ( ) physical hnd.
- ( ) sensory hnd.
- ( ) severely hnd.

Intended Age Level
- ( ) 0-3
- ( ) 3-6
- ( ) 6-9
- ( ) 9-12
- ( ) 12-17
- ( ) adult

Intended User Audience
- ( ) Teacher
- ( ) Aide/Paraprofessional
- ( ) Parent
- ( ) Other ____________

Scoring System
yes (Y) component is present
no (N) component is not present
partial (P) component is present
N/A does not apply

*Those components with an asterisk (*) are considered especially important for curriculum intended for severely handicapped individuals.

	ASSESSMENT				INTERVENTION			
	Yes	No	Partial	N/A	Yes	No	Partial	N/A
1. Skills are categorized into domains								
*2. Skills are part of longitudinal sequences which: a. allow for horizontal sequencing b. allow for vertical sequencing								
*3. Prerequisite skills are identified.								
*4. Procedures for assessment/verification of learner prerequisites to enter the curriculum domains: a. contain conditions b. contain criteria for completion								
*5. Procedures for initial assessment of skills to be taught are included (pretest) which: a. contain conditions b. contain criteria for completion								
6. Assessment items and instructional objectives are: a. criterion referenced b. norm referenced								
*7. Provision for monitoring progress (data collection) provides: a. formative data b. summative data including levels of acquisition c. sensitive to small increments of change								
8. States rationale for objectives: a. developmental b. remedial c. other								
*9. Specifies instructional objectives with: a. conditions b. criteria c. rate (attends to situationally appropriate rate)								

Table 14 (continued)

	ASSESSMENT				INTERVENTION			
	Yes	No	Partial	N/A	Yes	No	Partial	N/A
10. Provides instructional procedures: a. in a systematic format b. with error correction procedures c. with reinforcement procedures d. with antecedent cueing or prompting procedures.								
11. Objectives are cross referenced with other relevant domains contained in the curricula								
12. Specificity of assessment items and related instructional objectives is consistent across curricular domains in multi-domain curricula.								
*13. Contains defined sequence for objectives in task analysis format: a. finely sequenced small steps; b. variety of alternative responses c. offers alternative stimuli for sensory deficits								
*14. Functional applications of skills are assessed and taught.								
*15. Provides for maintenance of skills.								
*16. Provides for generalization of skills.								
*17. Provides for student-initiated performance of skills.								
18. Contains or suggests a variety of training activities for: a. games b. incidental learning c. other								
19. Materials are: a. legally duplicable b. durable and reusable c. safe d. inexpensive e. age appropriate f. easily adapted or modified								
20. Is easy to use (not cumbersome or time consuming)								
21. Language and amount of detail are appropriate for users who are actually delivering instruction.								
22. Has field test data available on use with intended population.								
23. Necessitates inservice training to effectively implement (required or suggested).								
24. Consultants are available to deliver training.								

CURRICULUM STRENGTHS

CURRICULUM WEAKNESSES

SUMMARY COMMENTS (Purchase/Don't Purchase)

Table 15

Curricula Reviewed

Communication Bricker, D., Dennison, L., & Bricker, W. A language intervention program for developmentally young children. Miami, FL: University of Miami, 1976. Guess, D., Sailor, W., & Baer, D. Functional speech and language training for the severely handicapped. Lawrence, KS: H & H Enterprises, 1976. Kent, L. Language acquisition program for the severely retarded. Champaign, IL: Research Press, 1974. MacDonald, J. & Horstmeier, Environmental language program, OH: Charles Merrill, 1978.	**Motor** Shearer, Billingsly, Frohman, Hilliard, Johnson, & Shearer. The Portage guide to early education: Instructions and checklist. Struck, R. Behavior characteristics profile. Santa Cruz, CA: Santa Cruz Public Schools, 1977. Williams, W., & Fox, T. Minimum objective system for learners with severe handicaps. Burlington, VT: Center for Developmental Disabilities, University of Vermont, 1979.	**Self-Help** Fernati, C., Lent, J., & Stevens, C. Project More. Bellevue, WA: Edmark Associates, 1974. McCormick Shearer, Billingsly, Frohman, Hilliard, Johnson, & Shearer. The portage guide to early education: Instructions and checklist. Williams, W., & Fox, T. Minimum objective system for learners with severe handicaps. Burlington, VT: Center for Developmental Disabilities, University of Vermont, 1979.
Social Carney, I., Clobuciar, G., Corley, E., Wilcox, B., Bigler, J., Fleisher, L., Pany, D., & Turner, P. Social interaction in severely handicapped students: Training basic social skills and social acceptability. In B. Wilcox, F. Kohl, and T. Vogelsberg (Eds), The severely and profoundly handicapped child: Proceedings from the 1977 statewide institute for educators of the severely and profoundly handicapped, State Office of Education, 1977 RADEA, Dallas, TX: Melton Peninsula, Inc. 1976. Westaway, A., & Apolloni, T. Becoming independent: A living skills curriculum. Bellevue, WA: Edmark Associates	**Vocational** Community-based prevocational training program for severely profoundly retarded youth. Seattle, WA: Division of Special Programs and Services, Special Services Section, Seattle Public School, 1978. Life experience program: An alternative approach to special education. Santa Clara, CA: Santa Clara Public Schools, 1973. Westaway, A. & Apolloni, T. Becoming independent: A living skills curriculum. Bellevue, PA: Edmark Associates.	**Home Management** Life experience program: An alternative approach to special education. Santa Clara, CA: Santa Clara Public Schools, 1973. Westaway, A., & Apolloni, T. Becoming independent: A living skills curriculum. Bellevue, WA: Edmark Associates.
Leisure/Recreation Bender, M., Valletutti, D., & Bender, R. Teaching the moderately and severely handicapped. Baltimore, MD: University Park Press, 1976. Wehman, P. Recreation and leisure skill curriculum for severely handicapped learners, Richmond, VA: Virginia Commonwealth University, (unpublished manuscript) 1978. Wessel, J. I CAN. Northbrook, IL: Hubbard, 1976.	**Community Survival** Bender, M., Valletutti, D., & Bender, R. Teaching the moderately and severely handicapped. Baltimore, MD: University Park Press, 1976. Life experience program: An alternative approach to special education. Santa Clara, CA: Santa Clara Public Schools, 1973. Westaway, A., & Apolloni, T. Becoming independent: A living skills curriculum. Bellevue, WA: Edmark Associates.	**Functional Academics** Edmark reading program: Teachers guide. Seattle, WA: Edmark Associates, 1972. Struck, R. Behavior characteristics profile. Santa Cruz, CA: Santa Cruz Public Schools, 1977. Uniform performance assessment system. Seattle, WA: College of Education, Experimental Education Unit, Child Development and Mental Retardation Center, University of Washington, 1978.

Table 16

Evaluation of Curricula Representing Six Curricula Domains

Evaluative Criteria	Percent* of Curricula (Rounded off to Nearest) ASSESSMENT Yes	No	Partial	N/A	INTERVENTION Yes	No	Partial	N/A
Skills are categorized into domains								
Skills are part of longitudinal sequences which:								
a. allow for horizontal sequencing	50	22	28	—	50	22	28	—
b. allow for vertical sequencing	89	6	6	—	83	11	6	—
Prerequisite skills are identified	39	39	22	—	39	39	22	—
Procedures for assessment/verification of learner prerequisites to enter the curriculum domains								
a. contain conditions	28	50	22		—	—	—	—
b. contain criteria for completion	50	44	06	—	—	—	—	—
Procedures for initial assessment of skills to be taught are included (pretest) which:								
a. contain conditions	56	17	27	—	—	—	—	—
b. contain criteria for completion	50	44	06	—	—	—	—	—
Assessment items and instructional objectives are:								
a. criterion referenced	83	17	—	—	72	17	11	—
b. norm referenced	22	78	—	—	22	72	—	06
Provision for monitoring progress (data collection) provides								
a. formative data	50	22	27	—	44	22	33	—
b. summative data including levels of acquisition	50	22	27	—	44	22	33	—
c. sensitive to small increments of change	44	22	33	—	33	33	33	—
States rationale for objectives:								
a. developmental	17	83	—	—	17	83	—	—
b. remedial	28	72	—	—	28	72	—	—
c. other	56	44	—	—	56	44	—	—
Specifies instructional objectives with:								
a. conditions	—	—	—	—	44	22	27	6
b. criteria	—	—	—	—	61	18	15	6
c. rate (attends to situationally appropriate rate)	—	—	—	—	17	60	17	6

Table 16 (Continued)

	ASSESSMENT				INTERVENTION			
	Yes	No	Partial	N/A	Yes	No	Partial	N/A
Provides instructional procedures:								
a. in a systematic format	—	—	—	—	56	22	17	6
b. with error correction procedures	—	—	—	—	39	39	17	6
c. with reinforcement procedures	—	—	—	—	39	39	17	6
d. with antecedent cueing or prompting procedures	—	—	—	—	39	39	17	6
Objectives are cross referenced with other relevant domains contained in the curricula	22	50	28	—	22	50	6	22
Specificity of assessment items and related instructional objectives is consistent across curricular domains in multi-domain curricula	39	6	17	39	39	6	17	39
Contains defined sequence for objectives in task analysis format:								
a. finely sequenced small steps	61	28	11	—	61	17	17	6
b. variety of alternative responses	33	50	17	—	33	50	17	—
c. offers alternative stimuli for sensory deficits	17	72	11	—	17	72	11	—
Functional applications of skills are assessed and taught	50	28	22	—	50	28	22	—
Provides for maintenance of skills	39	39	22	—	28	50	17	6
Provides for generalization of skills	33	56	11	—	33	56	11	—
Provides for student initiated performance of skills	0		33	—	0		22	—
Contains or suggests a variety of training activities for:								
a. games	—	—	—	—	28	61	6	6
b. incidental learning	—	—	—	—	11	66	6	6
c. other	—	—	—	—	—	—	—	—
Materials are:								
a. legally duplicable	—	—	—	—	—	—	—	—
b. durable and reusable	—	—	—	—	—	—	—	—
c. safe	—	—	—	—	—	—	—	—
d. inexpensive	—	—	—	—	—	—	—	—
e. age appropriate	—	—	—	—	—	—	—	—
f. easily adapted or modified	—	—	—	—	—	—	—	—
Is easy to use (not cumbersome or time consuming)	—	—	—	—	—	—	—	—

Table 16 (Continued)

	ASSESSMENT				INTERVENTION			
	Yes	No	Partial	N/A	Yes	No	Partial	N/A
Language and amount of detail are appropriate for users who are actually delivering instruction	100	—	—	—	96	—	—	4
Has field test data available on use with intended population	17	33	44	—	17	33	44	—
Necessitates in-service training to effectively implement (required or suggested)	—	—	—	—	—	—	—	—
Consultants are available to deliver training	—	—	—	—	—	—	—	—

leisure, community survival/vocational, communication, and self-help. The majority of curricula reviewed in the above domains did nothing to address necessary learner prerequisites for use of the curriculum. Consequently, the consumer often does not have adequate information to determine whether the curriculum is appropriate for individual learners of concern.

Assessment Procedures

Initial assessment. A little more than half of the curricula contained procedures for initial assessment. Only half the curricula specified both conditions and criteria for items used in initial assessment. Lack of specific conditions and criteria for assessment items makes the reliability of the initial assessment procedures of many of the curricula suspect.

Provision for monitoring progress. Approximately half of the curricula reviewed provided some device for use in the compilation of formative and summative data. Fewer than 45 percent of the curricula reviewed provided an assessment system that appeared to be sensitive to small increments of learner change. Consequently the use of assessment procedures contained in the curricula reviewed would require significant changes. Without such changes, the usefulness of these procedures with severely handicapped learners is questionable.

Rationale for objective: Only a few curricula provided a rationale for objective selection. The domains involving motor and communication were the most straightforward about declaring their theoretical basis. Of those curricula that did declare a basis in a particular theory, few provided justification for their approach. Consequently, it was not possible to determine the construct validity of most of the curricula reviewed.

Instructional objective (including functional application of objectives). All curricula reviewed attempted to provide instructional objectives. Eighty-three percent of the curricula were criterion-referenced. However, the conditions and criterion components of the objectives were often vague or lacking. Few curricula were sufficiently explicit in specifying conditions to permit systematic and reliable replication of assessments based upon the objectives. Frequent omissions included materials, position of learner and position of materials. In the communication domain, for example, no specification was typically made of the position of objects or significant others.

Fewer than 20 percent of the curricula specified situationally appropriate rates of behavior in their instructional objectives. This represented a particular point of weakness in that skills cannot be emitted functionally in the natural environment unless they are emitted at appropriate rates.

Instructional Procedures

The majority of the curricula reviewed did not provide specific instructional procedures. Generally, the curricula attended to what should be taught (the objectives) and left it up to the educator to determine how to teach it. Many curricula suggested that procedures should be based upon behavior analysis/ behavior modification and implied that the educator should have a basic knowledge of behavior analysis prior to using the curriculum. Lack of precise delineation and how to teach specific objectives may be a curriculum strength, *not* a weakness, since instructional procedures often have to be highly individualized on the basis of individual student learning styles. A cookbook approach to instructional procedures may actually be more harmful than helpful. However, curricula should state that a prerequisite to effective use is a basic knowledge of systematic instruction.

Cross-referencing. Approximately 44 percent of the curricula reviewed included multiple domains. These included, for example, such domains as home management, self-help, communication, and others. Objectives in one domain often required actions or skills very similar to those required in another domain. Identification of such objectives can result in the selection of excellent objectives across domains that can be implemented simultaneously. Very rarely did any of the multi-domain curricula cross-reference these. Even when cross-referencing did occur, there was not an adequate description of or emphasis on the use of the cross-reference.

A related area of analysis involved the consistency of assessment items and related instructional objectives across domains in multi-domain curricula. In general, most curricula were inconsistent across some skill domains. For example, within any multi-domain curricula, it was quite likely to find that two or three domains were extremely consistent in form and specificity while other domains were very inconsistent.

Finely Sequenced Steps

Sixty-one percent of the curricula reviewed used a task analysis format and sequenced the skills to be taught into small steps. However, 39 percent of the curricula did not sequence skills into small steps and/or only broke some skills into small steps. It was surprising that a higher percentage of curricula did *not* sequence skills to be taught into small steps, since this approach has been demonstrated to be highly effective with severely handicapped learners.

Alternative Stimuli and Responses

About one out of five of the curricula addressed either alternative stimuli for those with sensory deficits *or* alternative response modes. One domain notoriously weak was communication. In an area where there are clearly a variety of augmentative response modes (communication board, signing, vocal model, combination of any preceding modes) only one communication curriculum reviewed offered information on an augmentative mode, and this information was not integrated into the program itself. Self-help curricula were among the best in addressing alternative response modes but did very little to address alternative stimulu for sensory deficits.

Maintenance, Generalization, and Self-Initiated Performance

A weakness of 50 percent of the curricula was that they did not emphasize or provide procedures for assessing and teaching functional applications of skills. Very few curricula suggested using a variety of training activities such as games, play activities, and functional tasks to facilitate skill maintenance and generalization.

Maintenance, generalization, and self-initiated performance were areas very often ignored by the curricula reviewed, yet these concerns are critical to programs designed for the severely handicapped. Without maintenance, generalization, and self-initiated performance, a curriculum must be viewed as needing teacher adaptation in order to be successfully used with severely handicapped learners.

Materials

Nearly all of the curricula reviewed were attractively packaged and reasonably easy to follow. Most curricula had legally duplicable components and were durable and safe, relatively inexpensive, and modifiable. Generally, the language and amount of detail were appropriate to users actually delivering instruction. Packaging and physical display of the information to be communicated by the curricula was one of the best features of curricula reviewed. Unfortunately, this attribute may reflect more on creativity for marketing than on superiority of content generated by the authors.

Field test data. Approximately half of the curricula reviewed reported that their program had been field tested. Relatively few curricula specified the extent to which the program had been field tested. No curriculum reported individual field test data on each component of its program. The reviewers could only assume that some curricula had been extensively field tested while others may have not been field tested at all.

Discussion

As illustrated by this curriculum evaluation section of the chapter, it is not difficult to criticize and find flaws in the curriculum development efforts of others. Overall, however, we were quite impressed with curriculum development efforts to date. Generally, the curricula reviewed provided educators with useful information on educational programming for the severely handicapped.

When critiquing curricula, it is important to keep in mind the constraints under which most curriculum developers operate. Curriculum development is a very time-consuming and expensive process. Due to funding requirements, curricula must often be developed in a relatively short period of time (two to three years) within a limited budget. Such restraints often prohibit extensive field testing and revision of curriculum over time, based upon field test data. It is interesting to note that the authors of most of the curricula reviewed indicated that their curriculum did not represent a final product and that the curriculum should be updated as the data base on providing educational services to the severely handicapped increases. Unfortunately, once a curriculum is published there is no guarantee that it will be updated or removed from the market when it becomes outdated, no longer represents best practices, or ceases to meet the needs of the field.

It is the experience of the authors that most publishing houses are currently unwilling to underwrite the costs of developing and continually updating curricula for the severely handicapped. The market for such curricula does not appear to justify the development costs. The implication is that additional sources of funding must be secured to underwrite long-term curriculum development efforts to ensure that the resources are available to adequately field test and validate curricula for the severely handicapped.

Widespread educational programming for the severely handicapped is a relatively recent phenomena. A data base indicating the variables that should be addressed by curricula for the severely handicapped is still emerging. Given the relative recency of educational programming for the severely handicapped and lack of this solid data base, it is surprising that so many curricula were available.

In general, the curricula reviewed were very basic. They provided a framework for assessment, determining instructional objectives, and monitoring learner progress. Only a few curricula were sophisticated enough to provide a framework for designing instructional procedures, implementing horizontal programming, measuring small increments of learner skill development, assessing and teaching skill maintenance, assessing and teaching skill generalization, assessing and teaching self-initiated skill use, assessing and teaching functional application of skills, providing for alternative learner response modes (e.g., signing, communication board) and offering alternative stimuli for learners with sensory deficits. It is hoped that future curriculum development for the severely handicapped will attend to these variables.

In addition, current and future curriculum development efforts should more clearly specify the conditions and criteria used to determine skill acquisition, delineate the use population for the curriculum and learner prerequisite skills, describe the rationale for objective selection, and provide field test data to document the reliability and validity of the curriculum for the intended population.

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Appendix A

Brushing Teeth Training Model

(Vogelsberg et al., 1980)

Description of Component	Example
Terminal Objective: Statement including the behavior one wants to achieve, the conditions under which it will be worked on, and the criterion for successful completion of the program.	When Ross gets up in the morning, he will take out the items he needs and brush his teeth independently in 5 minutes or less for 3 consecutive days.
Rationale: An explanation of why one chooses to teach the skill.	Knowing how to brush one's teeth thoroughly will facilitate good hygiene, clean teeth, independence in self-help skills, and acceptable social appearance.
Trainee: A brief description of any relevant information concerning the trainee that would be helpful in implementing the program (e.g., need for adaptive equipment, behavior problems).	Ross needs specially designed toothbrush with an adaptive handle for greater control over his movements. Is nonverbal.
Materials: List of materials used in program.	Toothpaste, adapted toothbrush, cup, sink towel.
Instructional Arrangement: Includes when and where instruction will take place.	Training will occur 7 days a week at 7:00 A.M. at Ross's apartment.
Instructional Procedures: Delineation of how one intends to teach the individual the specific behavior. This may include the use of instructional formats such as modeling, prompting, fading, forward and backward chaining. It will be necessary to include the phases and steps through the instructional sequence. Sometimes a flowchart will be sufficient in covering all of the above information. If not, this section will supplement the flowchart.	Toothbrushing was broken down into component steps in a task analysis. See error correction procedure for use of pointing, prompting, and praising. See flowchart for details. Task Analysis 1. Remove toothbrush from cabinet. 2. Take out toothpaste from cabinet. 3. Take out cup from cabinet. 4. Pick up toothpaste. 5. Remove cap. 6. Put cap down. 7. Pick up toothbrush. 8. Squeeze toothpaste on brush. 9. Put toothpaste down.

Description of Component	Example
Data Collection: This will help the trainer to assess the trainee's progress toward skill acquisition. It will give an indication of the success or need for revision of the program. Things to attend to are rate, percent of task correct, and amount of assistance necessary. A rate graph will show acquisition of task, while an independent steps graph will show where assistance is needed.	Two example graphs are included; % correct with amount of time to complete total task, and steps to criterion. (See attached samples.) Independent performance is defined as performance of toothbrushing behavior initiated by trainee, performed by trainee, and terminated by trainee, without any prompts or directions from an external source.
Basically, data collection is a system through which a record of the level of the trainee's performance defined in operational terms, is kept. The recorded information becomes a progress report for the program.	See data sheet.
Generalization: Provisions for performing the skill across persons, places, materials, and language cues should be a part of the program.	Persons: Not applicable; should be performed in absence of any persons. Places: As Ross sometimes stays at his parent's house, one session a week is conducted there. Language Cues: Not applicable; should be performed in absence of any language cues.
Maintenance: This involves performance of the behavior over time once training has been terminated. If the behavior is not being maintained, a return to daily instruction is warranted.	Trainer will intermittently stop by Ross's apartment before he leaves for work in the morning and have him brush his teeth. Data will be collected. If the data shows a drop in performance below criterion, over 3 maintenance checks, the trainer will return to program conditions. Trainer will also stop by intermittently and check Ross's toothbrush and toothpaste to determine whether or not he has been brushing his teeth without any prompts.
Self-Initiation: This involves performance of the behavior by the trainee without any prompts at the appropriate time.	Terminal Objective implies the necessity of self-initiation. Can be monitored as maintenance section implies.
	10. Brush teeth: a. lower outside left b. upper outside left c. lower outside front d. upper outside front e. lower outside right f. upper outside right g. lower inside left h. upper inside left i. lower inside front j. upper inside front k. lower inside right l. upper inside right 11. Spit into sink. 12. Turn on cold water. 13. Rinse out brush. 14. Put brush away in cabinet. 15. Pick up cup. 16. Fill cup with water. 17. Rinse mouth. 18. Spit into sink. 19. Put cup away in cabinet. 20. Rinse out sink. 21. Turn off cold water. 22. Put cap on toothpaste. 23. Put toothpaste away in cabinet. 24. Wipe mouth with towel.

Consequences: A) What kind of reinforcement is being used; description of the error correction procedure. B) Error Correction: What to do if the trainee performs incorrectly or does not perform at all. C) Description of Teaching Procedure: Flow Chart	When appropriate, social praise is given on a variable ratio schedule (approximately VR 3). If Ross performs a step of the task analysis incorrectly, or fails to perform the task, the trainer (T) should correct Ross as necessary in the following order 1) verbal instructions, 2) point prompt + verbal, 3) physical guidance + verbal. See Flowchart.

SUPPORT SERVICES

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Effective educational programming for severely handicapped students differs from that provided more mildly handicapped students. One of the major differences is the extent to which support services are required by severely handicapped students, many of whom are multiply handicapped. These students may require a wide variety of medical, psychological, therapeutic, and social services. Unfortunately, as the need for a variety of services increases, it becomes more and more difficult to coordinate the efforts of educators and support service personnel in developing and implementing coherent, effective, individual programs for each student.

To gain an appreciation for the complexity of this problem, we can look to the federal law which has designated the kinds of services to be provided for handicapped students. The Rules and Regulations pertaining to the implementation of Part B of the Education of the Handicapped Act (P.L. 94-142), list the following activities under the designation _related services_, which includes all supportive services.

> As used in this part, the term "related services" means transportation and such developmental, corrective, and other supportive services as are required to assist a handicapped child to benefit from special education, and includes speech pathology and audiology, psychological services, physical and occupational therapy, recreation, early identification and assessment of disabilities in children, counseling services, and medical services for diagnostic or evaluation purposes. The term also includes school health services, social work services in schools, and parent counseling and training. (_Federal Register_, 1977, 121a.13)

In most programs, educational staff and representatives from the various support service disciplines are organized into an educational team. This team must work together in a process that includes at least the following: (a) assessing student needs; (b) establishing goals and objectives; (c) providing services to students; and (d) evaluating student progress toward specified goals. Unfortunately, as Brown, Nietupski, and Hamre-Nietupski (1976) have noted, the teams rarely function to produce coordinated, empirically verifiable educational outcomes.

At least two problems continue to hamper team efforts. First, programs have in the past attempted team approaches that were not responsive to the unique needs of severely handicapped students in educational settings. The multiplicity of handicaps and the learning characteristics of severely handicapped students require the development of team approaches which differ significantly from those developed for other students, and the team approaches which have been developed for severely and multiply handicapped students have usually been geared to medical rather than educational settings. Second, programs have not been developed with appropriate empirical methods for evaluating support service input. Thus, they are unable to assure that necessary services are integrated into educational programs and that unnecessary services are eliminated. This prevents the development of more effective models.

Over the past 5 years, several new team approaches have been developed which may provide some much needed direction for educational programs serving severely handicapped students. Most of this work has been done by individuals associated with a series of model projects funded by the U.S. Office of Special Education. A selected set of these projects is reviewed in this chapter. Hopefully, this review and other material presented will provide some suggestions for further work by emphasizing potentially useful approaches. Before reviewing aspects of particular projects, however, it may be helpful to present some background and general considerations for team functioning in educational programs.

TEAM APPROACHES

The necessity of working together as an educational team to meet the needs of severely handicapped students is recognized by practitioners representing various disciplines. Special educators (Bricker, 1976; Scheuerman, 1976; Hart, 1977), therapists (Sternat, Messina, Nietupski, Lyon, and Brown, 1977; Stremel-Campbell, 1977; Stone, 1977; Campbell, 1977), and medical personnel (Beck, 1977) have all called for more effective and integrated approaches.

The severity and multiplicity of handicaps these students present to teachers, therapists, and parents require working together as a team. When teachers find that traditional teaching methods are not sufficient to achieve educational objectives, they must look to therapists for assistance in the use of prosthetic devices, in the design of therapeutic techniques for facilitating and inhibiting movement, and in the use of various alternatives for communication and mobility. When therapists find that gains from individual therapy are lost and further deformities and contractures develop, they must look to parents and teachers to provide ongoing therapeutic arrangements for students throughout the day. Parents, too, find that the daily tasks of feeding, dressing, and transporting severely handicapped students require specialized assistance from teachers and therapists. Clearly, team members need to share information and work together, but professionals have yet to develop an entirely satisfactory approach for team interaction. Much of the exchange is haphazard and informal. To be effective, the team approach must result in educational plans that are feasible for parents, teachers, and therapists to implement. The programs developed must lead to critical skills for students and must be cost-effective for schools to provide.

Three team approaches have been identified in the educational literature: the multidisciplinary, interdisciplinary, and transdisciplinary team concepts. There is general (Hart, 1977; McCormick and Goldman, 1979), but not unanimous agreement (Bricker and Campbell, 1980) that the transdisciplinary approach may be most appropriate for programs serving students with severely handicapping conditions. The major advantage of this approach is its emphasis on sharing of skills among team members. In practice, as these approaches have been applied to programs for severely handicapped students, distinctions between them have blurred. They are similar in terms of strategies for assessment and educational planning and differ most often in terms of service delivery. The remainder of the chapter will (a) compare the direct service delivery model of the multidisciplinary and interdisciplinary approaches with the indirect model of the transdisciplinary model, (b) discuss the unique learning characteristics of severely handicapped students, and (c) suggest ways in which these team approaches must be adapted to meet the needs of students.

Multidisciplinary and Interdisciplinary Approaches: Direct Service Models

These two approaches are similar and will be discussed together. The multidisciplinary approach was originally developed for medical settings, but has been utilized in educational settings as well (Hart, 1977). The interdisciplinary concept, which includes the addition of the "case manager" to the team of specialists, is a modification developed to deal with the communication difficulties inherent when a number of specialists work with a single student or family. In both of these approaches, the functioning of team members generally conforms to the following procedure: (a) each member of the team carries out individual assessments to determine current levels of student functioning; (b) observations and results of testing are compiled into a report which is presented at a multidisciplinary staffing; (c) the team makes decisions about the programming needs of each student; and (d) individual therapists or specialists begin individual therapy with students as needed or as caseload will permit. When applied to educational programs for severely handicapped students, this approach may present problems in assessment, in educational planning, in service delivery, and in evaluation of effectiveness. These problems are more fully described below.

Assessment of severely handicapped students is a complicated task for any team. When team members work in isolation, it is unlikely they will generate useful data in the initial assessment phase. The multiplicity of handicaps requires the input of a variety of disciplines working together on the initial assessment. For example, if the student is severely physically handicapped, materials will need to be adapted and techniques for facilitating movement may be required to allow the student to make a response. If the student is non-verbal, the examiner may need to be familiar with alternative modes of communication. Students with sensory deficits will present further complications to the assessment process. Lastly, for students with severely handicapping conditions, it is often difficult to identify a motivational system to maintain reasonably stable forms of behavior for the assessment period. As Bricker and Campbell (1980) point out, there appears to be little value to a traditional multidisciplinary assessment prior to some preliminary training efforts with the student. All too often, individual evaluations are inaccurate, irrelevant, or simply label students "untestable."

The educational team may also have difficulties in developing educational plans for students. Setting priorities for intervention is a major problem. The needs of these students may result in team recommendations so numerous and complicated that they cannot be implemented within the constraints and resources of the program. This is a particular problem in the situation where the specialists on the team serve a diagnostic function and have no responsibility or accountability for implementation of recommendations.

A second problem in planning is conflicting recommendations. At the multidisciplinary staffing, the educator may recommend self-care programs using motor responses which the physical therapist recommends should be inhibited. The physician may recommend levels of medication for seizure control which interfere with the student's performance on educational programs. In this situation, a danger exists that recommendations will be chosen, or conflicts resolved, in relation to the status or personality of the individual team member rather than on the basis of student needs.

The team planning process must include appropriate strategies for prioritizing and evaluating both educational and support service activities. Before developing an individual educational plan (IEP), each proposed activity should be evaluated against the "criterion of ultimate functioning" analysis (Brown, Nietupski, and Hamre-Nietupski, 1976). The team should be unwilling to spend valuable instructional time in activities which cannot be linked directly to the acquisition of critical skills. Support services should be selected and evaluated by their contribution to these skills as well.

If the IEP process as described by Edgar (1977) is followed, support service activities could also be appropriately selected and evaluated. The educational team -- including parents -- is responsible for selecting yearly goals that are functional and attainable for each student. Short-term objectives to accomplish the yearly goals are then developed and stated in observable and measurable terms. As needed, support services are brought into play to assist the students to meet short-term objectives. These related services are then listed and linked to the objectives. When the objective is met, new objectives are determined and necessary support services are again negotiated. If the objective is not met, or if input from support services cannot be empirically related to the acquisition of the short-term objective, then revision is necessary. The particular input may be changed or eliminated and the time devoted to other activities.

Support services selected for students should never be determined by the availability of particular personnel. For example, the presence of a language therapist on the team does not necessarily mean each student receives language therapy, even though each student may have language deficits. Of course, goals for functional communication must be developed for every student. If the input of a language specialist is required to meet short-term objectives for some students, then specialized input is provided to the kind of longitudinal, comprehensive programming these students require 24 hours a day.

Transdisciplinary Approach: An Indirect or Consultative Service Model

Recently, a number of individuals working with severely handicapped young children and youth have suggested a transdisciplinary approach to programming (Bricker, 1976; Hart, 1977; Vincent and Broome, 1977; Peterson, 1978; McCormick and Goldman, 1979). The defining characteristics of this approach are the sharing of skills among team members and the breakdown of traditional discipline roles. Assessment and planning may proceed in a fashion quite similar to a multi- or interdisciplinary team and may be subject to many of the difficulties in assessment and planning described earlier. A major difference in approach, however, occurs in the implementation of recommendations of the team. One or perhaps two members of the educational team are designated to provide direct service to the student and family, while the other members act as consultants.

Therapy services within a transdisciplinary approach are provided through an indirect or consultative model in which educational staff and parents are primary implementors and provide most of the direct service to students. Therapeutic intervention is integrated into the instructional programs and occurs in the classroom, home, and other naturalized settings. Usually, individual therapy rooms and individual therapy sessions are eliminated. Therapists work directly with teachers and students in the classroom. They train parents and teaching staff to use the therapeutic techniques required by the student's educational programs.

The transdisciplinary approach has the potential to use personnel and student time very effectively. Because parents and teachers are trained to provide much of the intervention, therapists can serve larger numbers of students, albeit indirectly. Student time is used more effectively because individuals who interact with the student on a continual basis provide the therapeutic intervention. Time is not spent in transporting students from session to session, and most importantly, skills are acquired in the environments in which they will be used, an important consideration for severely handicapped students.

Implementation of a transdisciplinary approach has some inherent difficulties. It may be difficult to achieve the level of cooperation, collaboration, and trust required among team members to facilitate sharing skills. While specialists and teachers may those students. However, if teachers and parents can implement the programs to meet the short-term objectives for communication, then specialized input may not be required. In this way, the expertise of the therapist and limited time available can be used effectively. One benefit may be more cost-effective and accountable educational programs. Clearly, if the input of specialists can be linked to data showing acquisition of critical skills, the system is in a much better position to defend the use of professional time and thus assure continued funding for support services.

In terms of service delivery, the multidisciplinary approach usually involves an individual therapy or direct service model in which each team member implements the recommendations generated by his/her discipline. With such an approach, severe time constraints can occur. Even after priorities are established, there may be insufficient hours in the day for individual therapy, daily caretaking activities, transporting of students and effective instructional programming. McCormick and Goldman (1979) report teachers may spend as much as 78% of their time transporting students and providing daily caretaking when a traditional direct therapy approach is applied in an educational program for severely handicapped students. This ineffective use of teacher time is of particular concern because recent data suggest student gains are directly related to time involved in direct instruction (Fredericks, Anderson, and Baldwin, 1979). A model in which specialists and educational staff must compete for direct instructional time, with a large proportion of time spent in non-instructional activities, is simply not appropriate.

Further, the direct therapy approach does not use available personnel in a cost-effective manner. Several years ago, Bricker (1976) suggested the direct therapy approach, i.e., individual therapy for each severely handicapped student, might overburden the financial resources of school programs. Certainly the economic situation of the schools has not improved in the ensuing years. We can anticipate limited support service personnel for the foreseeable future. With a direct therapy approach, when available therapists' caseloads fill, the only alternative is waiting lists, with no input for students whatsoever. Alternative models, which "spread the effects" of therapeutic input, must be developed.

Finally, and perhaps most important, an individual, isolated therapy approach does not deal with the difficulties severely handicapped students may experience in maintaining and generalizing skills. This occurs because mechanisms are not developed for insuring that parents, teachers, and others who interact with the student on a continual basis have the skills necessary to provide be willing to work together to achieve objectives with students, the next step, actually training the other team member to use therapeutic or teaching techniques, can be threatening to some individuals. Training someone else requires specifying exactly what is being done and what is to be achieved. Thus, it places the team member's skill under close scrutiny. Further, each team member may have concerns about maintaining a unique contribution to the team or retaining a position on the team. Last, each team member feels a responsibility to the students and may doubt that other team members are competent to perform effectively in this model. The team must be made up of competent and mature individuals. Closely related to these problems is the necessity for careful specification of an inservice training strategy to achieve transdisciplinary exchange. While it is clearly not reasonable to try to train others to know and carry out all aspects of all roles, it is unclear how much general and specific information should be exchanged.

Assuming the team does function with specialists acting as consultants, the consultant role must include direct work with students and teachers, i.e., ongoing direct consultation is required. Strategies for maintaining accountability and responsibility for each team member must be developed. Though teachers and parents are doing most of the implementation, the accountability of support service personnel must not be lost. Teachers cannot be left with total responsibility and accountability for the students' progress. These issues will be discussed in greater detail as specific projects are reviewed.

No matter how complex and problematic a transdisciplinary approach may be, some version of this orientation appears to be required if the educational system is to provide appropriate education to all severely handicapped students. A transdisciplinary approach is efficient in terms of student and staff time and is the approach most responsive to the unique learning characteristics of severely handicapped students.

Learning Characteristics of Severely Handicapped Students.

In developing a team approach, we must consider the learning characteristics of the students to be served. The goal of intervention is student change. The possibility of behavioral change can be maximized by looking at how these changes occur with severely handicapped students. Severely handicapped students differ from more mildly handicapped students in a variety of ways that interfere with skill acquisition, maintenance, and generalization

(Williams, Brown, and Certo, 1975). While severely handicapped students can learn a variety of skills (Berkson and Landesman-Dwyer, 1977), these students do not learn from casual exposures to learning materials. For the skill to be acquired, instruction must be precise. What is to be taught must be carefully delineated in sequences of behavioral objectives that move from very simple to more complex, and a precise arrangement of antecedent and consequent events must be provided for the student(an applied analysis of behavior teaching technology). For the behavior to be maintained, environmental contingencies to support the behavior must be maintained as well. This suggests skills selected for instruction should be functional for the student so that natural consequences are more likely to be present in the environment to maintain the behavior. Highly artificial tasks, unrelated to critical skills and supported by the delivery of tangible reinforcements are unlikely to be related to any long-range, positive educational outcome for the student. Further, educators cannot assume that skills acquired in one setting will generalize to another, but must instead train for generalization by varying the persons, materials, and settings for instructional programming. As a general rule, skill training should probably be carried out in the environment in which the skill is to be used (see, for example, Kohl, Wilcox, and Karlan, 1978).

These considerations will be important for any intervention in which behavior change is the goal. If the therapist wants behavior obtained in the therapy room to be maintained and generalized to the classroom and home, then appropriate antecedent and consequent conditions must be maintained in those environments. Teachers and parents will need to provide appropriate feedback to the student and, with concerns for generalization in mind, therapeutic work with the student will need to occur in the classroom, home, work setting, or other naturalized environment.

The following section will examine the extent to which the essential features of a transdisciplinary approach (a training oriented model with 24-hour implementation by educators and parents, specialist accountability, and so on) have been present in the support service component of model programs funded by the U.S. Office of Special Education.

APPRAISAL

The support service components of four federally funded projects for severely handicapped students are described below. Each project was strongly committed to a team approach and each adapted a multidisciplinary or interdisciplinary approach to its educational program. Each of the projects was examined to determine strategies which accomplished effective team intervention and coordination of team efforts. In establishing a consistent framework for review, Bricker's (1976) conceptualization of four underlying principles or strategies for productive interaction among educators and specialists was used as a starting point. These principles are:

1. Team members must possess a positive attitude in terms of seeking and sharing information;

2. Educators and specialists must be accessible to one another;

3 Communication must be facilitated through the elimination of nonessential jargon;

4. A method must be developed for transmittal of selected information.

These principles formed the basis of the evaluation criteria applied to individual projects.

Evaluation Criteria

The following discussion presents an expanded rationale and further detail on how these principles for team interaction were used to review particular programs. Much of this discussion is drawn from Bricker's (1976) work.

Attitude. A positive attitude toward sharing and seeking information is reflected behaviorally in activities of training others and of receiving training from others. A commitment to train others reflects the belief that one's knowledge is of potential value to the team, while a commitment to be the recipient of training reflects the equally relevant belief that no one person possesses all necessary and sufficient knowledge.

Professionals working with severely and multiply handicapped students are usually willing to present their approach to others and seldom feel content that they have all the information and skill needed to work effectively with these students. At times, though, their commitment to sharing and seeking information goes further than a series of inservice lectures. For shared information to be translated into empirically verifiable educational objectives, the team members must not only present information from their disciplines, they must allow and encourage the utilization of specific techniques by others. They must define their techniques and the situation in which these techniques may be utilized in precise detail so that team members can reliably carry out these techniques and evaluate the effects on student performance. The inservice plans of model projects should deal extensively with this role release and training issue.

A further difficulty arises when some members of the team do most of the sharing (training) and the others do most of the seeking (recipients of training). For example, in reviewing the inservice plans of some projects, it is apparent that specialists provide training to the educational staff, but it is not so apparent that the educational staff is providing training in the instructional, behavior management and data collection procedures which are so necessary for effective communication and intervention.

Accessibility. For the team members to function effectively, they must be accessible to each other. The physical set-up of a program can help assure accessibility and interaction among team members. If therapy services are integrated into the classroom, home, or other naturalized environment, some informal interaction is likely to occur between teachers, parents, and therapists. However, mere physical accessibility and informal interaction are probably not sufficient for effective coordination of team efforts to occur.

Planned interactions among team members must be scheduled. The goal of planned interactions is for the team members to consult with each other in working toward common educational goals. This mutual consulting must include not only provision for setting objectives, but also for monitoring and revising input in a timely fashion. The traditional monthly staff meeting is not sufficient for this purpose. In educational programs for severely handicapped students, the therapists, teachers, and parents will need to spend much of their time working together. The most effective consultation will occur when team members are actually problem solving together in the instructional situation.

Educational programs will not always include the entire cadre of specialists needed or desired. Most likely, the educational staff will have limited accessibility to the kinds of information specialists can provide. In this situation, educators must seek the most appropriate information possible in the limited amount of time available for interaction. The educator must keep educational goals for the student in mind. Appropriate questions center around pinpointing problem areas and difficulties that may be impeding the student's progress toward critical skill development, and may include requests for help in devising alternative approaches to critical skill development. Campbell (1977) has described a problem-oriented mode for interaction which could be utilized in these instances.

In the difficult situation of limited availability of specialists, there may be one positive result for the educational team. The necessity of sharing information and skills may be more sharply drawn than in the situation where a choice between direct therapy or a more integrated approach exists. The team may therefore spend less time debating the advisability of one approach over the other. If the team evaluates the particular therapeutic techniques used, in terms of educational outcomes, student needs may be well served even in this situation.

Communication. Eliminating nonessential jargon will help team members communicate. To some extent each discipline has a language or jargon all its own. These specialized uses of words make cross-discipline communication difficult. Programs with a commitment to effective communication will try to establish guidelines for reducing unnecessary jargon. An emphasis on behavioral description rather than on labels should be encouraged (McCormick and Goldman, 1979). Inservice training should assure that each team member can formulate objectives in terms of observable and measurable behavior. This approach is valuable and can be used independent of content area, discipline, or conceptual framework represented.

Programs that recognize the importance of communication among team members will also provide noninstructional time for communication and planning to occur. While there is no substitute for actually being in the teaching/learning situation, there is also a necessity for planning time when team members can work together other than during direct instruction. Preparation time required for working with severely handicapped students is often underestimated. One unfortunate effect of insufficient planning time can be the utilization of valuable instructional time for preparation of materials, revision of programs, and communication with other team members.

Finally, programs should develop specific techniques to assure that communication has occurred, i.e., that information has been acquired and can be used by others. Inservice training efforts must be evaluated. The evaluation should be directed to both information and performance competency (Tucker, Hollis, Sailor, Horner, Kelley, and Guess, 1976). Information competency may be evaluated by paper and pencil tests, but performance competency can only be determined by observing the trainee's use of a technique in working with the student or family.

Selective transfer of information. When a team of highly trained specialists agree to share information and expertise, it is difficult to decide what information, of the immense amount available, should be targeted for exchange. Some inservice training programs appear to have adopted a strategy which includes presenting a "watered down" version of each discipline. This plan is probably not helpful in meeting staff or student needs. The result can be a series of vague, theoretical lectures. Even when the material presented includes a series of specific intervention techniques, it is unlikely these techniques will be integrated and used, unless the trainer clearly relates the material to the specific educational objectives of individual students.

Information to be presented for inservice training or any team exchanges should be selected on the basis of staff and student needs. Two kinds of training are probably needed. First, it may be necessary to present some introductory material to familiarize the team with general concepts from all the disciplines. The emphasis should be on minimum informational competency and minimum jargon, or special terms which may be essential to working and communicating as a team. This kind of inservice should be time limited, such that sufficient time is allowed for the second activity, group problem solving. Most inservice activities should be directed to whatever contemporary problems face the intervention team, i.e., the parents, educational staff, and specialists who are implementing, monitoring, and revising individual student instructional programs.

PROJECT REVIEW

The review of these projects was based on project proposals and reports, i.e., written materials. The projects varied in the amount of detailed description provided for the support service component, which may have limited the review in some cases. In the following section, the plans of the projects are compared with the framework previously described.

The Projects

Project 1. The first project reviewed was a public school program providing center-based and homebound instruction for severely handicapped students from 3 to 21 years of age. The project was fortunate to have a full complement of specialists and educational staff. These individuals were organized into a multidisciplinary team. With a team of eight individuals, a particular concern was for project strategies for coordinating services and information flow.

This project clearly had a positive attitude toward sharing information among team members as evidenced by an ongoing inservice training program. However, the inservice training appeared to be a series of highly complex lectures, with little encouragement for team members actually to utilize techniques from other disciplines. Individual team members were not responsible for training others to use specific techniques. Knowing about other disciplines was a substitute for sharing skills to solve student problems.

Staff who wished to familiarize themselves with specific techniques were encouraged to take outside courses. While outside courses may provide valuable information, this is hardly a remedy that is universally available or desirable. The multidisciplinary team in this project could have developed methods for familiarizing staff with specific techniques needed for daily work with students. If one can judge from the educational materials presented by project personnel, they are a highly competent, up-to-date group. It is unlikely an outside course could provide the quality of training they could have provided for each other.

The project attempted to make staff members accessible to one another; the support service personnel worked in the classroom. However, the actual physical arrangement of the classroom may have diminished opportunities for interaction and for integrated programming. The classroom was divided into "pods," with a motor area, a cognitive area, and so on. With this arrangement, it is difficult to work on multiple objectives within functional tasks, in part because staff members tend to segregate themselves. The communication specialists usually work in the language area, the physical therapists in the motor area, and the teachers in the self-help or cognitive area.

This project appeared to have some communication problems. One, the training materials provided by the project were full of highly technical language. The educational staff was left with the task of relating this material to the needs of individual students. It seemed unlikely that this kind of support service input would be integrated into individual educational programs without some direct and ongoing assistance from the specialists.

The second difficulty concerned the roles of team members. The social worker was designated "team manager" and was to coordinate home and school programs. While this may have facilitated communication in some general way, the social worker did not provide the kind of specific parent training required to assure programs established in the school were maintained in the home. Parents were not included as members of the educational team.

Their role was described as one of providing love; they were admonished to avoid unfamiliar techniques and to remember that parents are not therapists. While certainly the kinds of interactions parents have with their children differ from those of other professionals in very important ways, parents of severely handicapped students do need specialized training. It can be very difficult and frustrating to provide daily care and parenting to a severely handicapped child or youth, without significant help from teachers and therapists. (Note Vincent's chapter in this volume.)

The project did not include a delineation of how information for transfer was selected. The project attempted to teach a "watered down" version of each discipline. To their credit, the team members attempted to evaluate these lectures. Unfortunately, the evaluation consisted of paper and pencil tests of information without a competency-based evaluation. Thus, it remains unknown whether teachers, parents, and therapists were able to use any of this information. The evaluation of support service input was not related to student gains on critical skills, but took the form of yearly standardized assessment and monitoring; and ongoing revision of instructional programs, with the assistance of specialists, appeared to be lacking in this project.

Project 2. The second project reviewed was a program for orthopedically impaired students. In this project, twelve 9 to 13-year-old students were served in a private, segregated school. The project utilized a multidisciplinary team concept, with occupational, physical, and language therapists, diagnostic coordinator, social worker, physician, nurse and psychologist, as well as the educational staff of teachers and aides. The team was clearly committed to sharing skills and information. The inservice plan was directed to staff gaining skills outside the traditional discipline roles. Teachers and parents were trained and encouraged to use specific therapeutic techniques. The inservice plan was also quite flexible; it consisted of a series of planned inservice activities and some unplanned staff development time. The content of the unplanned sessions was to be defined by current needs of the staff. This is a good plan because it prevents the frustration produced by inservice activities when other, more pressing needs for information or training exist.

Another very positive aspect of the inservice plan was training for all staff in writing behavioral objectives for instruction. This material was very appropriately presented in the initial stages of the project. Unfortunately, information on data collection was not presented until near the end of the first year. It seems preliminary work on writing behavioral objectives and collecting data could probably be presented as part of project orientation, near the beginning or even before services to students begin. These skills are central to effective programming, and the staff needs to begin immediately developing these competencies. Aspects of data collection and objective writing will probably need to be reviewed and developed throughout the program.

Team members were accessible to each other, with much of the therapy carried out in the classroom. The therapists consulted with teachers in developing functional skill programs. The project seemed to use a combination of a direct therapy model and a more consultative model. Student schedules indicated that individual therapy was included in each student's day, with the therapists also planning with teachers for follow-through. While cost information was not available, this plan must have been expensive, perhaps prohibitively so for many other programs.

As noted above, the staff planned for communication to occur. A particularly noteworthy component was the involvement and communication with parents. Parents were trained to implement teaching technology and were rated for teaching competency. This approach clearly increases the probabilities for generalization of skills to the home. Further, a daily notebook for students to take home was used for communication between home and school. Parents were provided workshops for general information and individual counseling as needed. Communication among team members, including parents, was probably facilitated by the general absence of unnecessary jargon throughout the project description.

The project did not specify clear guidelines for team interaction. It appeared that each member of the team established goals for his or her area of expertise, but it was not clear how overall priorities for intervention were established. While teachers were responsible for integrating input from the team into the daily educational programs, the support service assistance with this process varied widely across team members. For some therapists daily interaction with the educational staff was planned; others planned weekly or monthly interactions. While daily interaction may not be required among each and every team member, it does seem that a monthly check does not allow for timely revision of individual programs or for problem solving.

One further comment: this project appeared to have many excellent services for students. However, it is a general concern that a program such as this one may not always evaluate whether or not students actually need to be in a setting that provides all these services. For example, Bricker and Campbell (1980) noted that some of their institutionalized students did not need the critical nursing and medical care provided by the hospital setting. This is a problem because at times, the availability of a wide range of support services becomes the rationale for keeping students in restrictive settings (see Wilcox and Sailor, in this volume).

Project 3. The third project provided educational services in three settings: an institution, a segregated special school, and a regular education school with self-contained special education classrooms. The program served severely, multiply handicapped students from 3 to 21 years of age. Fifty percent of these students were motor-impaired and some had sensory deficits. In terms of support services, a full compendium was available in the institutional setting, fewer were available in the special school, and fewer still in the regular school. As the project utilized its continuum of service options to move students to less restrictive settings, problems arose in providing educational staff with necessary support.

The project had a stated *commitment to sharing information* among team members. Their approach to delivery of support services was described as indirect, with physical and language therapy integrated into the classroom program. However, teachers did not have therapists on the team and there were no arrangements for consultation with specialists. The educational staff had no ongoing exchange to assist them in their efforts to utilize therapeutic techniques. Teachers did have some isolated workshops on positioning students. However, without ongoing help in utilizing these kinds of techniques, it is difficult to effectively integrate this information into the student's educational program. The inservice training component appeared inadequate to meet staff needs.

The team members were *inaccessible* to each other, and unfortunately this was particularly true in the less restrictive setting. In the other settings, a more traditional multidisciplinary approach was utilized, with the team of specialists serving primarily an assessment role. Teachers were responsible for implementation of the students' IEP's, while the multidisciplinary team provided a twice-yearly evaluation of the students' progress. It appeared that even in these settings, *specialized information* was not likely to be available to educational staff as needed.

In the community-based program, the make-up of the team appeared to be a problem as well. The team consisted of teacher, aides, applied behavior analysis consultant, liaison worker, and university practicum students. The teacher's role was to supervise the activities of practicum students and aides, as well as to implement, monitor, and revise educational programs for students.

without the assistance of physical therapists and others with specialized knowledge, this plan appeared untenable. By combining classes, the project provided some noninstructional time for each teacher to use for planning and revision of educational programs; however, no support service personnel were available for problem-solving with teachers.

The interaction between the applied behavioral analysis consultant and the classroom staff was a positive aspect of the team functioning. The consultant worked in the classroom, and the intervention programs developed by this person were rated by the staff as helpful in managing behavior problems. It seemed this individual could have provided more inservice training to staff, parents, and practicum students. Perhaps this would have increased the probability of maintaining behavior change in other settings, as well as reducing the supervising and training load on the teacher.

In the final report from this project, staff noted that they had underestimated support service needs. They also noted teacher burn-out as a problem. It seems that unless ongoing, planned exchange occurs among specialists and teachers -- to generate ideas, to develop specific programs, and to provide feedback and encouragement to each other -- burn-out does occur rapidly. Further, it should not be necessary for the entire team to be available at all times. In fact, as students move to more normalized settings, these entire teams will not be available. Strategies for utilizing consultants who are only available for a limited amount of time must be developed.

Project 4. A university's program for severely handicapped students was the last project reviewed. This project provides services at three sites: in a Center for Severely Handicapped; in a segregated, public school for trainable students; and in regular schools with special classes. A full team of specialists and educational staff was available at the Center and at the segregated school, with itinerant specialists available to the special education classes in the regular school. The approach to support services was labeled interdisciplinary, and the team included parents, teachers, therapists, and other health professionals.

A strong commitment to sharing information among team members was evidenced by a comprehensive inservice training program, which was geared to bring all staff into a common core of information. This core included the generic skills of objective writing, task analysis, and evaluation procedures. Parents were the recipients of training as well. Individually tailored programs to be carried out in the home were presented to parents. Evaluation of parent teaching skills and feedback to parents was made possible through the use of videotaped interactions between parents and students.

Team members were accessible to each other at the Center and at the special school, through direct involvement in the classrooms and in homes. Specialists were less accessible to education staff in the regular schools. However, the project recognized this problem and attempted to secure specialists' participation at staffings and involvement in the classroom programs.

The project developed a specific communication plan for how the team should function. This interdisciplinary education team process included the following guidelines:

1. Evaluation occurs in the natural environment, the classroom, and home.

2. Team efforts are intervention-oriented and ongoing, rather than diagnostic and episodic.

3. Suggestions for program changes generated by the team are evaluated by ongoing child performance data.

4. Team members function according to an agreed upon interactional process.

These guidelines provided explicit statements that could be used as goals for team interaction. As new programs were developed, each new team had to go through a process of adopting these goals. Consequently, there was predictably some unevenness from program to program.

It appeared that the specific information shared by team members, including parents, was determined by the educational needs of the student. Further, the evaluation of support service input was linked to student performance. Using this approach, the team should be able to integrate therapeutic or other techniques when needed, eliminate unnecessary input, and remain alert to the necessity for revisions in student instructional programs.

FURTHER EVIDENCE OF THE STATE OF THE ART

There are many complex, largely unresolved problems related to the utilization of support services in educational programs for severely handicapped students. The four projects reviewed have attempted to deal with some of these problems. The following section will describe some other educational approaches that show promise. These descriptions can be taken, perhaps, as starting points for further development by those working in the field.

One interesting approach was that of the Chicago Early Childhood Education Project (Peterson, 1976; Brackman, Fundakowski, Filler, and Peterson, 1977), which applied a transdisciplinary model to the education of young severely handicapped students, birth to 8 years of age. The Chicago Project was characterized by the following principles which guided interactions among team members:

1. Therapy services were delivered in the classroom or home. Therapists always worked in collaboration with students and parents or students and educational staff.

2. The major team function of specialists was to train parents and classroom staff to use techniques and procedures to assist children to meet educational objectives. In turn, educators trained specialists to use teaching technology which prepared them to use a data-based, task-analytic approach.

3. Specialists developed an objective and reliable procedure for documenting that specialized skills had been learned and were being used effectively.

4. Each staff person was a consultant to other staff and parents in their area of expertise for the purpose of developing individual educational plans. However, they were not necessarily responsible for carrying out those plans. Major responsibility for implementing intervention plans was given to parents and educational staff, teachers, and aides.

5. Each member of the team was responsible to assure child progress toward specified objectives and their participation on the team was predicated on demonstrating effectiveness through child performance data.

The inservice training plan of this project included some innovative strategies for selecting skills for transdisciplinary exchange and for documenting acquisition and maintenance of these skills (Peterson, 1978). Inservice training within this model was directed to a sharing of information and skills among the team members. The plan included two components: (a) an intensive workshop for all staff, held before services to children begin; and (b) ongoing longitudinal consultation among staff members. The goal of the initial workshop was to impart a common core of knowledge, essentially informational competency, to all staff. Ten individual modules on substantive issues were presented by team members. In each module, the trainers (members of the team representing each discipline) selected initial targets based on their best judgment of critical material. It then became the trainer's responsibility to demonstrate empirically that he or she had successfully imparted information to staff, which met or exceeded pre-established criterion levels. Evaluation consisted of paper and pencil pre and post testing for informational competency. Perhaps more important, trainers attempted to demonstrate staff could utilize this new information, i.e., could demonstrate performance competency.

Because children and their families were not available at this time, situations were contrived to test for performance competency. For example, role playing among staff members was used to evaluate particular teaching skills and therapeutic intervention techniques. Staff were required to carry out task analyses and to observe behavior and collect data. In sum, this workshop set the tone for the team interaction. Staff were trained and encouraged to use specific techniques, with feedback from appropriate team members. Further, the responsibility for trainee competency was placed on the trainer, and the challenge was for the trainer to develop effective strategies for the task. An evaluation of this workshop (Filler, Hecimovic, and Blue, 1978) suggested these essentially didactic methods were effective for building information competency to specified criterion levels, but for some staff were unsuccessful in establishing performance competency.

To assure staff performance competency, ongoing inservice training was provided throughout the program. Planned exchanges occurred in the classroom and in children's homes. The specific content to be exchanged was determined by the educational needs of the children, i.e., specific techniques required to meet individual short-term objectives. Because a very high percentage of the population was physically handicapped (85%), it was often necessary to utilize techniques from physical, occupational, and language therapy (particularly prespeech and feeding). When it was determined that parents or teaching staff, or both, needed competencies therapists could provide, then the following procedure for training was followed:

1. The therapeutic technique was task analyzed into a series of components defined in behavioral terms.

2. The resulting written sequence of behaviors was discussed with the teacher or parent and clarified (redefined) if necessary.

3. The technique was demonstrated or modeled by the specialist with the child, to assure that necessary child behavior was established.

4. Under supervision, the teacher or parent utilized the technique with feedback from the specialist.

The therapist worked with the child and teacher or parent in successive sessions until the technique was mastered and the child was making progress toward the particular educational objective related to the technique. A simple rating scale was used to evaluate effectiveness of training. For each step in the program, the trainer rated the performance of the trainee in the following fashion:

1. No correction necessary

2. Verbal suggestions

3. Verbal suggestion accompanied by some physical correction

4. Necessary to re-demonstrate

If the parent or staff person was unable to achieve a rating of 1 on all aspects of the technique within 2-3 training sessions, then revision of the training program was required. This usually involved branching of particular steps in the sequence. Adequate performance of the therapeutic technique was linked to concomitant gains by the child. Following training, if the child performance data did not indicate movement toward the specified objective, the team was alerted to the need for re-evaluation of the teaching strategy, including the specialized technique, to determine the point of breakdown. (Examples of these therapeutic technique training programs have been presented elsewhere, e.g., Peterson, 1978, 1979, and are available from the author.)

Thus, this project appeared to make some gains toward defining an empirical approach for evaluating particular support service input. Further, the inservice plan assured that parents and teachers were provided the skills they needed to provide effective ongoing instructional programming. The process of validating the training worked to assure specialists that parents and teachers could actually perform the techniques and that student behavior change occurred.

To develop effective team models for severely handicapped students, much work remains to be done. Meaningful comparisons of different approaches to team interaction are needed, as are data which consider student gains and cost effectiveness. Recently, some systematic evaluations of particular components of educational programs appeared. For example, Bricker and Campbell (1980) report some data on the effectiveness of a multidisciplinary assessment, and McCormick and her associates (McCormick and Goldman, 1979; McCormick, Cooper, and Goldman, 1979) have evaluated the classroom component of one team approach. The data from these two projects provide very useful information, reviewed below.

The Molly Stark Project for severely handicapped adolescents (Campbell, 1977; Bricker and Campbell, 1980) served multihandicapped students, 11 to 22 years of age, who resided in a hospital setting. Students were provided initial multidisciplinary assessment, which included recommendations for treatment, further evaluation, equipment utilisation, and individual educational or therapy activities. On analysis, project staff found that of the 397 recommendations generated by the team, only 30% were judged appropriate and specific enough to be incorporated into students' educational programs. In reviewing the actual rate of implementation over an 18-month period, it was found that only 17% of the recommendations were ever implemented. Further, correlational analysis indicated that, as the number of handicaps per student increased, the rate of implementation decreased. Thus, for the more severely multiply handicapped student, the evaluation was largely irrelevent to intervention. All of this was accomplished at a cost of approximately $2500 per student for assessment alone. Project staff questioned the feasibility, in terms of cost effectiveness and staff time, of a process which yields such limited results. Bricker and Campbell suggest that the multidisciplinary assessment required by P.L. 94-142 may need to be reinterpreted or redefined for severely and profoundly handicapped students. They suggest the major difficulty appears to be isolated assessments by specialists with no prior experience with the students, and a lack of efforts to establish stable forms of behavior before assessment.

These authors suggest that the most effective use of professional time would entail the following activities:

1. The professional time spent in multifactored assessment which precedes programming should be used in the process of attempting to bring about initial changes rather than in attempting to assess particular behaviors.

2. Professional time should be spent in programming within the classroom and in the assumption of professional responsibility for progress in the area of expertise identified for each team member.

3. Professional time can be spent in careful analysis of each student's performance on identified programming targets, in the development of precise training strategies which are tested and known to be effective with each student, and in specific training of each individual to carry out established programs.

McCormick and Goldman (1979) advocate a transdisciplinary model for serving severely handicapped students. They present reliable, classroom observational data that suggest that a direct service model results in inefficient use of teacher time (as mentioned earlier) and an inequity in terms of distribution of service responsibilities across the disciplines. From their data it is apparent that, at least in the three classrooms they observed, educational personnel devoted approximately half as much time to instruction and twice as much time to caretaking as did ancillary (support) personnel. In a follow-up study, McCormick, Cooper, and Goldman (1979) attempted to deal with this problem by training teachers to combine instruction with caretaking. With appropriate inservice training, they were successful in increasing instructional time. However, this did not solve the inequity in terms of caretaking. The authors suggest support service personnel should be in the classroom, providing therapeutic input during caretaking, e.g., during feeding, positioning, toileting, and dressing -- activities which do occupy a large proportion of a severely handicapped student's day. A transdisciplinary approach would work to distribute responsibilities more equitably, in addition to the advantages described earlier.

The transdisciplinary approach appears to have clear superiorities to the other approaches described. However, the teams in this review were often quite similar, both in approach and in the problems they encountered, regardless of the label assigned. Thus, in one way, perhaps we could forget the labels. However, one crucial difference in these approaches is the degree of team members' willingness to train others in cross-discipline skills. This is one distinction we must not lose.

As noted by McCormick and Goldman (1979), personnel preparation for those coming into this area must reflect non-traditional ways of interacting. Recently, Knapczyk and Denver (1979) have suggested additional training for supervisory personnel to prepare them to assist the team in coordinating service. Further, those of us who have been traditionally trained must change the way we interact with each other and with the students. The strongest impetus for these changes will come from child data demonstrating the effectiveness of cooperation and collaboration.

SUMMARY

Confusion continues regarding roles of the members of the educational team in programs for severely handicapped students. Our notions in this regard are changing and evolving rapidly. Ideas that seemed good five years ago did not work well in practice and modifications were necessary. However, some trends continue to emerge which we can now identify.

There is a clear trend for support services to be mediated through one or a few service providers, usually educational staff and parents or care-takers. This indirect model, however, is now viewed as predicated on some careful work by teachers and specialists working directly with students to assure that team goals can be met, before techniques are deemed suitable for exchange.

Educational teams are beginning to take a problem-oriented approach to selecting necessary support services. There seems to be a general recognition that support service input must be evaluated in terms of progress toward specified educational objectives. This leads the team to view its role as removing obstacles to achievement of those objectives. More is not necessarily better in terms of number of staff and composition of teams. The input of support services must be subjected to the same data-based evaluation used to make programming decisions in the precision teaching methods used with severely handicapped students. Those aspects of support services that cannot be linked to child gains can be eliminated, leaving more instructional time for alternative programs.

The role expectations of members of the educational team are being more carefully delineated. Most professionals would agree that teachers must take a central role and responsibility on the team, particularly as the role of other team members becomes one of facilitating the individual educational plan. However, the numerous responsibilities and roles assigned to teachers, i.e., manager, synthesizer, programmer, and implementor, can exceed what is possible or desirable. Strategies for assuring more effective and equitable roles for team members are being developed. The role of therapists as consultants remains, but is going through modifications. To function effectively, therapists must be fully functioning members of the team, working daily with parents, students, and staff, if their consultation is to have an impact. The presence of a variety of specialists will not magically assure student gains. Therapists must work with teachers to develop training strategies and must be available for ongoing, rather than episodic, monitoring of the training programs.

Despite the lack of hard and fast answers, there are certain errors that should not be repeated. For example, it appears that too many resources and too much time have been invested in the past in isolated, initial multidisciplinary assessments. These assessments have had limited value for subsequent intervention. Assessment and therapy need to be continuous activities. Traditional, isolated therapy models are not useful to severely handicapped students. In efforts to provide teachers with information through inservice activities, it has become clear that teachers are unlikely to be able to incorporate a lot of general input from specialists into student educational programs. Consequently, programs should not spend valuable teacher time on inservice activities that do not have clear relevance to staff and student needs.

The entire educational system is changing as severely handicapped students are brought into public education. To assure that needed support services are available, strategies are needed to make those services accessible. At times, there are shortages of specialists who are trained and interested in working with severely handicapped students. At other times, only itinerant specialists are available. Provisions must be made for educational staff to have ongoing, longitudinal consultation with specialists, including the very necessary planning time to work together with specific students on specific programs.

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FAMILY INVOLVEMENT IN THE EDUCATIONAL PROCESSES OF SEVERELY HANDICAPPED STUDENTS
STATE OF THE ART AND DIRECTIONS FOR THE FUTURE

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The passage of Public Law 94-142 has resulted in a mandate that parents/family must be involved in educational decision making related to their handicapped child. The letter of this law, as well as of many state laws, establishes that parents/family will at least be informed of the educational goals and progress of their child and have the right to disagree with decisions made by public educational systems which relate to their handicapped child. The spirit of parent/family involvement which was specified by Public Law 94-142 is certainly much more extensive. In the spirit of the law, parents are viewed as dynamic decision makers and strong resource people for the public schools. Parent involvement means "activism," not just the "passivism" of being informed.

The Law's acceptance of the role of parents/family in the handicapped child's educational program comes from at least six sources. Briefly, there are, first, legal actions such as the Pennsylvania Association for Retarded Children versus Commonwealth of Pennsylvania and Mills versus Board of Education (Turnbull and Turnbull, 1978) which established the parent as having a right to due process procedures. Second, parent organizations, such as the National Association for Retarded Citizens, which were influential in the development and passage of Public Law 94-142, set the stage for activism by parents. Third, the basic consumer-as-evaluator attitude of the 1970's helped promote parents' rightful place to criticize services received by their children. Fourth, the data gathered on the success of programs where parents served as teachers clearly pointed to greater child progress with parent involvement (Hanson, 1977; Moore, Fredericks, Piazza-Templeman, and Blair, 1979). Also, Baker (1979) demonstrated that parents can be as effectively trained as professionals and paraprofessionals in child development theory and technology. Fifth, data generated on the lack of skill generalization and maintenance by handicapped students (Stokes and Baer, 1977) forced educators to acknowledge the need to teach handicapped students across environments. Sixth, the acknowledgement of the need for curriculum goals which reflected skills necessary to function in natural rather than classroom environments forced educators to learn about the students' home environment (Brown, Nietupski, and Hamre-Nietupski, 1977; Brown, Branston-McClean, Baumgart, Vincent, Falvey, and Schroeder, 1979). Added to these was the common sense reason that parents/family, not educators, are most capable of serving in consistent, longitudinal advocacy for the handicapped student.

Given these powerful legal, philosophical, and data-based reasons for parent involvement, one would assume that model programs have built comprehensive parent/ family involvement components. A review of the programs funded by the Special Needs Section of OSE's Division of Innovation and Development lead the authors of this chapter to conclude that generally this was not the case. Parent involvement, when included, tended to be unidimensional and without systematic evaluation as to effectiveness. While several of the projects had developed outstanding products to teach parents to be teachers, for example, none of the projects focused on building a model system for comprehensive parent/ family involvement. Also, none of the projects reviewed reported data on parents' satisfaction with the services they received. The question that immediately arises is why active parent/family involvement in the severely handicapped child's educational program was not the major focus of these programs. Certainly one reason is that establishing exemplary models for professional teaching of the severely handicapped student was clearly needed at the time these projects were implemented. However, a brief look at the history of the relationship between parents/family and educational programs, particularly public school based programs, indicates other reasons as well.

HISTORY

Professionals in the field of special education now generally recognize that the most long-term advocates for handicapped individuals are his/her parents or legal guardian (Vincent, Dodd, and Henner, 1978). The term "parent/family" is used to designate anyone who serves as the primary caregiver or advocate for the severely handicapped student, not necessarily only the biological family. While, historically, educational system personnel and parents have often been adversaries in the process of obtaining educational services for severely handicapped students, new federal legislation and state rules and regulations have mandated that such adversarial relationships end. Increasingly, administrators and teachers are talking about forming cooperative partnerships with parents. Most often this talk is vague and unspecified in terms of what constitutes a cooperative partnership.

In order to define cooperative partnership, assumptions that each partner makes about the other partner must be examined. In the area of severely handicapped students, the public schools' previous history of excluding these students and/or segregating these students, has resulted in many families/ parents having negative attitudes toward the school system. Thus, the assumptions that parents hold about the schools may interfere with forming a cooperative partnership.

Similarly, public school system personnel have developed negative assumptions about the parents and families of severely handicapped persons. These negative assumptions grew out of parents' fighting for services which school systems historically did not believe were worthwhile to provide to severely handicapped students.

Four of the negative assumptions held by the two partners are presented in Table 1. As statements show, both partners question whether or not the other partner is really committed to the teaching and development of the severely handicapped student. Both partners question the other's willingness to change and constructively solve problems. Both partners question the other partner's knowledge of the needs of the severely handicapped students.

Historically, many public school systems have been "guilty" of the omissions highlighted from the parent perspective. These authors, however, do not believe that parents are or ever have been generally "guilty" of the problems or beliefs espoused by the professionals. Many parents have effectively involved their severely handicapped child in their natural home life for years. Almost all parents have taught their severely handicapped children skills. Sometimes these skills are not the most desirable ones, but they certainly have been taught.

These authors also believe, however, that attributing blame to one partner or the other does not solve the problem of building a cooperative partnership. Rather, the differences and similarities in the two partners' views must be examined, and ways must be developed to capitalize on similarities and use differences to create innovative services.

One partner cannot build the partnership by deciding what the other partner needs. For example, the negative assumptions held by professionals have often led to the development of models for family involvement that define the family as a recipient of goods/services offered by the schools without the family being involved in deciding what services should be offered, or how and

TABLE I

Assumptions of Parents and Professionals Which Detract From a Cooperative Partnership

Professionals	Parents
1. Parents are not willing to use their home resources to work systematically with their handicapped child.	1. Public schools do not have the resources to meet the needs of severely handicapped students.
2. Parents have unrealistic expectations/do not know what is best for their handicapped child.	2. Public schools are not committed to meeting the multiplicity and intensity of the needs of the severely handicapped student.
3. Parents do not know how to teach their handicapped child effectively.	3. Public schools do not recognize the family's commitment to and skill with the severely handicapped student.
4. Parents need professionals to help them solve their problems. Parents contribute to the child's problem.	4. Public schools do not want parents involved in the major decisions related to the severely handicapped student's educational program.

when services should be offered. Often such services start with the supposition that parents/ families are in emotional crises and are not coping with their severely handicapped child and so they need to be trained to behave like the student's classroom teacher and that the personnel who provide the training should be teachers/educators. While some parents indicate a need for help in systematic behavior management, most parents are generally handling their severely handicapped children quite effectively at home. What parents identify as needs is not how to behave like the classroom teacher but how to use their home and natural interactions to teach the child. What they often identify as goals and objectives are skills the child needs to function more successfully in the environment, rather than typical school curriculum skills. How they see their child functioning is sometimes different than how school personnel see the child functioning.

This difference cannot be written off as the parents' error. The parents' ability to be an accurate assessor has been demonstrated by the reliability of instruments such as the Minnesota Child Development Index (MCDI) (Ireton and Thwing, 1972). The MCDI is a totally parent-completed assessment of the child's skills in major areas of development. Parents generally do know their child's abilities. They are realistic in goals that they set. At times they need additional information from educators, but they often have a better overall picture of the "whole child" than school personnel who only see the child in the unnatural, classroom environment.

UNIFYING ASSUMPTIONS

In order for a cooperative partnership to be built, both partners must examine the assumptions they bring to the situation. Then they must reach mutually agreed upon assumptions about the family and school system and mutually agreed upon goals for the child and for the involvement of the family. Following are assumptions about the family which come from a social systems network perspective (Napier, 1978; Hill, 1965; Levinson, 1975). These assumptions necessitate that the educational system shift its focus from the family as recipient of services to the family as determiner of services provided.

1. Families are capable of generating creative and innovative solutions to their problems. Often times these solutions can be developed without the direct help of professionals.

2. Families are interrelated units. Invervention in any aspect of the unit can affect all other parts of the unit. The handicapped child is only one part of the family unit. Intervention with the handicapped child will affect the rest of the unit.

3. All families, whether they have a handicapped child or not, have needs in the following areas: legal, medical, financial, social/recreational, and educational. By having a handicapped child, a family adds to these needs special educational considerations for the child. However, the special educational needs of the handicapped child should be analyzed in the context of the family's other needs.

4. The prime consumer of special educational services directed to the handicapped child is that child's family. As the prime consumer of educational services, the family should be the prime evaluator of such services. The evaluation implies that the family is given sufficient and sophisticated information to make informed judgment about the quality of services that handicapped child is receiving.

5. The special technology that is used in the instruction of handicapped individuals is learnable by and teachable to other family members. Specialized technology and specialized services should only be provided in areas where normal family and community services will not meet the handicapped child's needs. This implies minimal intrusion on the family unit for the purpose of meeting only one members' needs.

6. Both the educational system and the family share a common concern for the long-term functioning of the handicapped family member. Neither unit could thus totally meet the needs of the handicapped member by themselves. The most long-term, consistant, concerned advocate for the handicapped child is the family, not the public educational system.

7. Families do want to become involved in their handicapped child's program and do want to do what is best for the child. However, they are often not willing for what is best to be decided solely by personnel outside of their unit. Because of the family's ability to use its resources creatively and innovatively, it is possible for the family to solve its own problems. The solutions may require the help of formal resource systems, but not necessarily direction from formal resource systems.

8. Families, though this is a generic term, are by no means uniform in their make-up, goals, desires, or need for other than family services. The fact that families differ must be reflected in a variety of services and systems being available to assist them in educating their severely handicapped children.

Following are assumptions about the public school system which come from legal/legislative mandates and exemplary practice. These assumptions necessitate that the family shift its focus from adversarial relations with the schools to cooperative ventures designed to best meet the needs of their handicapped child.

1. Public school personnel are capable and want to create innovative, effective programs for severely handicapped students and their families.

2. Public school systems are responsible for meeting the educational needs of severely handicapped students and for coordinating with other systems and agencies, including the family which is concerned with noneducational needs.

3. Public school programs are required to and want to evaluate the effectiveness of the services which they provide to severely handicapped students and their families. As part of this evaluation, they want parent input.

4. The specialized technology employed by public school personnel in working with the severely handicapped students is teachable and learnable by nonprofessional personnel, including parents and other family members.

5. Both the family and the educational system share a common concern for the long-term functioning of the severely handicapped students. Neither unit could thus totally meet the needs of the handicapped student by themselves.

6. Public school personnel do want to create programs and services which maximize the functioning of the severely handicapped students in environments other than classrooms. They do want to program for nonacademic skills in school as well as in non-school settings.

The acceptance by both parents of the above basic assumptions about the strengths and intentions of the two systems, i.e., the family and the schools, should result in the acknowledgement of the commonalities in goals that the systems hold. Hopefully, such commonalities can lead to cooperative rather than adversarial relationships. Ultimately, both the family and the schools are concerned with what is best for the severely handicapped student today and in the future. The acceptance of these assumptions should lead to families becoming involved in major levels of decision making related not only to their individual child, but also to handicapped children of the future. Acceptance of these assumptions should lead to the creation of models for parent/family involvement which stress the parent/family as a major source of assessment and programming information for the severely handicapped student. The following section outlines areas of involvement for the parent/family which are based on the unique needs of the severely handicapped students.

THE UNIQUE NEEDS OF PARENTS/FAMILIES AND THEIR SEVERELY HANDICAPPED STUDENTS

In designing models for parent/family involvement in the educational programs that serve severely handicapped students, the focus should be on the unique, not normal, needs of these students. One major goal of these programs should be to maximize the normality of the family unit. Thus, families of handicapped students should be able to experience the same ups and downs that families of normal children do, e.g., frustration, joy, questioning, predicting. The major point that needs to be remembered is that these families are first of all normal families. They have all the needs that normal families have, as well as some unique needs because of their handicapped child. Studies have indicated that parents of severely retarded children do not differ markedly from parents of normal children on many psychological characteristics, e.g., psychiatric care (McAllister, Butler, and Lei, 1973; Routh, 1970). Families of severely retarded children do report more stress related to their child's unique educational and caregiving needs (Routh, 1970).

In designing model programs, the question arises as to what is unique about raising a handicapped child? What are the skills and the knowledge that the family will need to acquire that may not be readily forthcoming from their existing resource network? In a sense, what is it that makes raising a handicapped child different from raising a normal child? In general, the present authors believe that the difference is one of degree and not one of type. All children have medical needs, all families have financial needs, all children and families have educational needs; the uniqueness for the family of a handicapped child is that the child's disability may alter the intensity or severity of the need.

There are at least five major areas where the needs of the severely handicapped child make that child's family different than families of normal children. The first is that they have a child whose needs will not be met totally by normal experiences. The second area is that all children in this country have rights. Parents generally know those rights and sometimes violate those rights, but children have rights, and handicapped children have an additional set of rights. The third area is that all children need resources outside the family in order to flourish, e.g., medical and social. Handicapped children and their families are different because often the resources they need are not currently provided by normal agencies. The fourth area is that every family with a child must acquire skills in dealing with the public and private agencies that provide service to their children. Families of handicapped children must often have greater skills in this area because the number of agencies is larger and the variability of access to them is greater. The fifth area is that every family encounters situations in which they and their children have needs that existing agencies do not meet. They often resolve these needs by working to change current policies, current practices, or current funding.

Child Needs

Displaying an exceptional educational need, a handicapped child presents a unique set of features to the family. Parents cannot simply pick up Dr. Spock's book on baby and child care and learn the information that they will need in order to raise this child. Often simple tasks, such as feeding and diapering, become complex tasks when the child has a handicapping condition. Thus, the parent must learn a very specific set of skills related to their child's disability.

Child and Family Legal Rights

Because of recent court and legislative action, handicapped children in this country have been granted access to systems that are designed to maximize their potential. Legally, parents have a set of rights related to due process, to funding, and to educational practice that are dramatically different from the rights of parents with normal children. These rights and responsibilities have long-term implications for families of handicapped children. Knowledge of these rights will assist a family in pursuing the most appropriate educational program for their child.

Resources

Because of the unique needs of a handicapped child and the rights guaranteed to child and family by law, these people also need additional and specialized resources in order to maximize the child's potential. These resources apply both to the child and to the family, and their acquisition is essential.

Accessing Resources

While it might seem that the child's and family's rights under the law would guarantee that the resources they need would be easily obtainable, this is not yet the case. Often the resources are spread between two, three, four or fifteen geographically separated agencies. Often obtaining the resources requires sophisticated skills at communication, completion of forms, and perseverance. Some parents will need to be taught specific skills on how to find and then obtain appropriate resources for their child.

Changing Resources

Given that parents have the skills to find and access available resources, they are often still confronted with the simple fact that appropriate resources do not exist. In order to maximize the child's development, the parents need to learn how to force systems to create new alternatives and new programs for their children. Many families do not inherently have the skills at working with agencies, advisory boards, city councils, state governments, and individual administrators that are necessary in order to create change. The teaching of these skills is complex, yet possible, and falls within the domain of the educational interventionist.

Designing a program to meet these unique needs of families of severely handicapped students implies a long-term commitment between parents/families and educators/interventionists. These required skills cannot be taught overnight. Most professionals spend at least two years of intensive study in order to learn information related to child needs and rights and program evaluation. There are, however, areas of involvement in the handicapped students individual educational programs that could be initiated quickly with many parents and families.

INDIVIDUAL CHILD AREAS OF INVOLVEMENT

As related to the individual child, the authors believe that parents should actually be involved in at least five major areas. These are child assessment, child programming, determining child progress, making program decisions, and evaluating program success. Each of these areas is presented below with a rationale for their inclusion and suggestions for their implementation.

Child Assessment

Recent data would indicate that parents are very accurate diagnosticians and evaluators of their child's current level of functioning. Because of their long-term commitment to the child and the amount of time they spend with the child, parents often have information about the child's functioning that is not available from professionals' observations of the child in the classroom. Most clearly, parents have many more opportunities to observe their child's functional performance in independent self-care, neighborhood interaction, recreational/leisure skills, and social communicative behavior than classroom teachers. Not only do parents have more opportunities to observe these behaviors, they also have the advantage of observing these behaviors in the natural environment, i.e., the environment in which the child must function in the long run. If an educational system is concerned with teaching children the skills necessary to function as adults in a wide variety of community environments, it must find ways to tap this source of parent information. A well designed program of parent involvement will include an assessment (materials and procedures) which is completed by the parent on the child's skills in natural environment. Such procedures should be jointly developed with the parent and the information obtained would become part of the multi-disciplinary evaluation that leads to the development of an individualized education plan. Thus, in these author's opinion, asking parents what their child likes, dislikes, and does at home is one initial step in involving them in assessment. It is not sufficient to demonstrate active involvement of the parents in the educational process. Evaluatively, the present authors would recommend that all multi-disciplinary reports used to establish a child's current level of functioning be screened to ensure that at least one report is included from the parent/family.

Child Programming

Often parents are asked to participate in determining program priorities when they have not been involved in the gathering of assessment data and when a common perception on the child's current functioning by the teacher and parent has not been established. Professionals often comment that parents set unrealistic expectancies for their children. This is not surprising when parents have not been made privy to or part of the assessment process. The present authors would advocate the following parental goal-setting procedure. Parents should be given a form to record needed programming areas based on data gathered during family routine and activities. These priority areas should become part of the master list that is generated in conjunction with classroom and future priorities. In a sense, one function of the parent on the assessment program team would be to synthesize and interpret, within the framework of the natural environment the information given by the multitude of professionals who interact with their children. This implies that IEP's are not developed by the staff and then presented to the families for agreement or change but, rather, IEP's are developed with the family. By structuring the nature of assessment data gathered by the family and supplementing these data with classroom assessment, the professional can establish broad categories of concern for the whole team to focus on. As Roos (1977) has indicated, parents should be active in choosing goals and objectives for the child to work on. Teachers should be active in determining methodology. Just as teachers are not expected to determine goals and objectives for a child on the basis of a few hours' observation, parents should not be expected to develop goals and objectives without adequate background in assessment.

Evaluatively, program personnel might save the forms listing goals and objectives which parents bring to the IEP meeting and periodically compare them to final goals and objectives listed on the IEP. One would expect that at least some percentage of the final goals would correspond to the listed parent goals. If Roos (1977) is correct, the percentage should be close to 100 percent. Before implementing procedures such as this, projects might survey the percentage of families carrying out home programs and then survey again after implementing this procedure. Common sense would say that, if parents believe that they have influenced the setting of goals and objectives, they would be more likely to carry out the programs in the natural environment.

Child Progress

In the current state of the art, parents are told where their child is versus where he was at some specified earlier period and often not taught how such information is gathered or how frequently such information is analysed. As an outgrowth of teaching parents procedures for child assessment, it should be possible to teach them to conduct these assessments periodically at home and to bring this information on child progress to the sessions where child progress is to be discussed. The present authors assume that rather than simply receiving information on progress that professionals see in the classroom, parents should be active in documenting child progress in the home. Evaluation strategies similar to those used in the assessment and program priority area could be implemented. That is, parent progress records could be incorporated as part of the child's ongoing file and periodically files could be reviewed by administrators to determine what percentage of families are actively involved in this process. An interesting research study would be to compare the estimates by teachers of the child's present level of functioning and future environmental placement with those parents involved in such a process and those parents not involved in such a process.

PROGRAM DECISION MAKING

Just as parent involvement on individual child assessment should lead to parent involvement in goal and priority setting, parent involvement in program evaluation should lead to parent involvement in program decisionmaking. The authors of this chapter believe that parents, as consumers of services, are most concerned that these services be delivered in a cost-effective manner and that the services be delivered in a way that is maximally beneficial to all children. Most parents are highly capable of taking a step back from their own individual child to look at the overall system. Taking such a step back requires that they be provided the information related to program issues rather than individual child issues. Administrative personnel need to develop procedures for polling parents' knowledge of major areas of decisionmaking for the future. If administrators and teachers know that moving a program is a consideration, then parents should be informed that such considerations are under way. This is not to say that all parents will choose to be actively involved in this level of decisionmaking. Rather, it is to say that all parents should have the option of being involved. If asked whether they feel that they could have given input on decisions such as program schedule, resource allocation, and areas of needed curriculum development, all parents should answer affirmatively, even if only half of the parents said, "I did contribute." The atmosphere of opportunity for input is as critical as the actual numbers of parents who take the opportunity. The options must be provided by the educational program; the choice must be the parents'.

Educational systems should be required to submit plans for achieving a cooperative atmosphere. Plans should include information on how district administrators will systematically convey to parents that their input is needed. In addition, plans should include systems for evaluating how effective the plan was in developing this atmosphere.

PROGRAM EVALUATION

While the major concern of a family is probably their own individual child, his program, and his progress, many families are willing to become involved in overall program issues. Parents are generally a vastly underutilized resource of skills and expertise that could be helpful to an educator (Vincent, Dodd, and Henner, 1978). Involving parents in an overall evaluation of the services that they generally receive from the public schools is one way professionals can demonstrate they are concerned with parent input and with parent opinions. Certainly a yearly questionnaire to all families involved in a severely handicapped program would seem to be one main level of program evaluation. Such a questionnaire could be used to document areas of parental concern and desire. The present authors wonder whether such an evaluation is not done because the parent input is not wanted or because it has been determined a priori that the program would not be changed based on this input. While the prime receiver of educational services is the individual handicapped child, the prime evaluator of this service must be the child's parents. Parents are the major consumers of the variety of services provided to handicapped students. As such, parents should be the major evaluators of these services.

SUMMARY

If parents are to be involved in the manner just specified, the educational system will have to identify trained personnel and other resources providing leadership for this process. The child's individual classroom teacher usually does not have the time or expertise in assessing family needs and working with adults to develop and implement a comprehensive plan.

A considerable body of literature from the social sciences documents the ways that families of handicapped children are different than families of normal children. The trauma caused by the diagnosis of a severe handicap is also well documented. Clinical reports can lead to the conclusion that this trauma is so devastating that active, constructive involvement is not possible. Yet, if one returns to the unifying assumptions, the first one is that families are creative units who can and do solve their own problems. Many families experience traumas. Most of these families remain stable, active productive units. Focusing on the trauma of the handicapped child by professionals could hinder the process of problem-solving. Rather, the professional should focus on the normality of the family and family's need to solve problems. A commitment to active involvement of the parent/family in the child's educational program is a commitment of maximal growth, development, and skill acquisition by the severely handicapped student.

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REVIEW AND ANALYSIS OF PROFESSIONAL PREPARATION FOR THE SEVERELY HANDICAPPED

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Training, in the context of this chapter, is defined as the professional preparation of educational personnel to arrange, implement, and coordinate the total educational program in the school, the home, and the community. This would include the settings in which the educational program takes place. Professional preparation may be preservice or inservice and it may occur in colleges and universities and/or field settings.

Since Public Law 94-142 mandated a free appropriate public education for all handicapped children and youth, specialists in the field of education for the severely handicapped have been concerned with the quality of instructional programs and the preparation of qualified personnel. Now we are at a point where we must take a new look at training in order to determine: (a) what is the knowledge, (b) what are the attitudes, and (c) what are the skill proficiencies required of professionals to provide comprehensive educational programs for the severely handicapped. There are a number of questions to ask as we examine the training process:

- What are the most effective processes and experiences to incorporate in training programs?
- What should be our starting point?
- Which of the early undergraduate educational experiences are crucial to later teaching experience?

Essentially we must confront the issues of what to teach and how to teach it? What follows is a close look at the area of training, more specifically the training of professionals to work with the severely handicapped. Part I is an overview of existing training practices, beginning with an historical perspective, continuing with an examination of the needs of various personnel and current programs which serve these individuals, and ending with some guidelines for training in the form of minimum standards.

Part II examines existing training guidelines or "rules of thumb," in a general analysis of the state of the art. It formulates the ten most common assumptions of the majority of training models, based on an analysis of some approximations of such models. In Part III the author reviews, in some depth, four programs funded by the U.S. Office of Special Education. These are the professional preparation programs at the University of Kansas, University of Washington, University of Wisconsin, and San Francisco State University. Criteria for selection are set forth and specific relevant areas are addressed in order to elicit their commonalities and differences. The concluding section, Part IV, provides a summary and discussion of what constitutes "good training" and addresses minimum standards for model/demonstration centers and personnel preparation programs in providing quality training. The chapter ends with a forward glance at future issues and directions, avenues of potential research, and necessary systems changes.

AN OVERVIEW OF TRAINING IN THE AREA OF THE SEVERELY HANDICAPPED

Some History

As we review the history of the training of personnel to serve the severely handicapped, we confront the fact that it is a meager history. Before the 1950's there was, indeed, a paucity of professional preparation programs. During the 50's the number of professional preparation programs for the handicapped increased rapidly. For example, early in that decade, only a half dozen or so programs were available. Among the earliest were at the University of Illinois, Milwaukee State Teachers' College, Syracuse University, Eastern Michigan State College, and San Francisco State University. In those years, inservice training took place only in large state residential or private institutions -- and even there the training was essentially re-training. Teachers who had originally been prepared to work with the moderately or physically handicapped received new training (within the institutions) to work with the severely handicapped. If programs existed for training potential teachers of the severely handicapped, their focus was on physical handicaps and on children considered to be "educable."

Moving to the 60's and early 70's, we saw a rapid growth in professional preparation as a result of the expansion of special education programs to include the moderately handicapped in school districts across the country. At the same time, increasing numbers of deaf/blind children were entering special education classes--the unfortunate legacy of the high incidence of rubella in the 60's. The need was pressing, then, for the establishment of training programs for those who were to work with these newly included children.

Early programs were developed for the deaf/blind, multiply handicapped, physically handicapped, and autistic. Although there had been special programs in some local school districts and in some state residential institutions, the middle 60's marked the advent of widespread programs to prepare teachers of the multiply handicapped. One such program began in 1966 at the University of Washington--the nursery program for the deaf/blind. The University of Wisconsin's now highly developed program, under the capable direction of Lou Brown, set the standards early for excellence in teacher training. This was the first nationally recognized program for the severely handicapped, beginning in 1969 as a staff training program, developing by 1972 into a total undergraduate sequence for preparing teachers of the severely handicapped at the University of Wisconsin, with the Badger School as the field site. Programs in special education increased rapidly, stimulated by growing support of professional preparation by the U.S. Office of Special Education (which was then the Bureau of Education for the Handicapped).

In 1971, PARC vs. Pennsylvania was one of the first rivulets in the growing stream of judicial pronouncements that mandated the inclusion of the handicapped in the educational system. Long before this historic decision, the Bureau of Education for the Handicapped had foreseen equal educational opportunity for all and had begun its support of professional training programs. There were those who saw -- in the landmark 1954 decision of the Supreme Court (Brown vs. Topeka, Kansas Board of Education) -- that it was only a matter of time for its impact to be felt in the field of special education. The concept of equal educational opportunity for all signifies *inclusion*, not *exclusion*. As the influence of the 1954 desegregation order spread throughout the states and as public school systems began to include rather than exclude, the need for teacher preparation programs grew.

In a brief historical overview it would be redundant to dwell at any length on the dramatic impact of the passage, in 1975, of Public Law 94-142, except to acknowledge that it spurred a phenomenal increase in training programs. With federal support, programs were created and flourished. Growing numbers of handicapped children were waiting to be served, and professionals were needed to serve them. The training programs that were developed in *quantity* now need to be examined from the standpoint of *quality*. Our major concern is in the setting of standards for programs that train personnel, not merely to serve, but to serve with competence and with success.

Who Needs Training

Preservice needs. A great need in special education today is in the area of preservice education. Professional training, encompassing the most current educational and behavioral technology, is essential. If we assume that individuals are making life career choices as teachers of the severely handicapped, then the responsibility of providing a *planned, sequential* program of preparation for those individuals rests upon the universities and colleges. The goal of the university must be to produce *competent* professionals through programs that combine a conceptual *theoretical base* with *specific practical skills*.

Similar preservice training must also serve those preparing for service in other disciplines. If we believe--as indeed we must--that the best way to serve the needs of the severely handicapped is through comprehensive educational management, then we need to capitalize on the skills of a wide variety of professionals. The expertise of the communications disorders specialist, the occupational therapist, the physical therapist, the nurse, the social worker, the family service specialist, and others must all be combined in a powerful and effective service strategy. Such an interdisciplinary team can provide the comprehensive education that effects change--through the sharing of knowledge and skills--under the proficient leadership of the special education coordinator. One cannot emphasize too strongly the need for this kind of interdisciplinary effort in which service to children is not segmented but integrated. The exchange of information and ideas, which occurs when professionals work cooperatively and share common goals rooted in a shared philosophy, ensures that programs for the handicapped are of the highest quality. When barriers between the disciplines are transcended so that professionals can serve as models for one another and combine skills and competencies, an important instrument for change emerges in the educational management team.

Inservice/continuing education. A similar philosophy holds true for the inservice and continuing education of teachers and other professionals. Most of those currently teaching the severely handicapped are in need of skills that will enhance their effectiveness. Many were never specially trained for work with the severely handicapped, but were trained at a time when the accepted philosophy was that the severely handicapped were not educable. We have learned that individuals holding such a philosophy may not accept inservice training and may not be as effective with severely handicapped as those who do not hold these outdated philosophies. The same conceptual base and educational technology underlying the preservice program are appropriate for inservice programs, whose time constraints demand different formats, some of which will be described at a later point. In both preservice and inservice programs, paraprofessionals are considered integral parts of the educational team and follow the same pattern of planned sequential training.

Parent education. Two areas that have been overlooked to a great extent are parent education and community education. In the first instance, there is a desperate need to build or strengthen the relationship between home and school The essential commitment to the right of all to live in a home setting, to interact with parents and siblings, to share the joys of a natural environment, has come to be accepted by all who work with the severely handicapped. The development of programs of education for parents, based on this commitment, requires systematic examination of the emotional and physical demands placed on the family and the dynamics of family life as they are affected by the additional burden of caring for the severely handicapped child in the home.

The preparation of a professional must include training in parent education. A competent teacher of the severely handicapped will be one who can organize parent interaction and guide parents in developing the skills necessary to effect changes in their child's behavior. The partnership between home and school can be enhanced by effective training in parent education.

Community education. The community at large has little awareness of the needs of the handicapped. Much of their education is incidental to everyday observations of changes in buildings, at the curb-side, in elevators, on public transportation. In those communities where concerted efforts have been made to implement Section 504 of the Rehabilitation Act of 1973, the average citizen has a distinct advantage. The high visibility of the handicapped is itself a means of educating. However, this does not imply any systematic educational program by which information is made available to the community. In many parts of the country, true integration and inclusion are less than the reality, and education of the public, even through incidental contact with the handicapped, is sadly lacking.

Through community colleges, adult and continuing education programs, and community centers, opportunities can be offered for the general public to *meet* the handicapped, learn about handicapping conditions, and gain direct experience in planned educational programs. There is a place and a need for both *out-reach* and institution-based programming. The responsibility for such community education rests not only on any one agency, but on the cooperative efforts of higher education, rehabilitation agencies, and social agencies.

What Training Exists

Training for work with the severely handicapped does exist in a variety of university-based programs that range from a simple sequence of two or three courses to total coursework leading to the doctoral degree. To meet earlier critical demands, teacher training programs have been funded by the U.S. Office of Special Education's Division of Personnel Preparation to solve pressing problems involving quantity of trained manpower. It is quality that must now become the watchword. Service to the severely handicapped requires the competency of professionals; competent professionals, in turn, emerge from professional preparation programs of the highest quality. The successful education of the handicapped is dependent on the successful education of special education teachers. The success of both can be evaluated. Standards are necessary, and concomitant with them, the ongoing assessment of programs according to those standards. The same measuring sticks can be applied to the education of teachers, of other professionals, of paraprofessionals, of parents, and of the community.

Once a training program has established standards and objectives for attaining these standards, an appropriate evaluation design should be instituted for two purposes: (a) to determine whether objectives are indeed achieved, and (b) to demonstrate the effectiveness of training practices in fulfilling program standards in terms of positive changes in trainees, children, and/or service delivery or other systems. The measurement of change (and, hence, program effects) can be simplified by operationally specifying program areas targeted to produce change and then pinpointing the types of change desired and the means for measuring change. If the best practices in personnel preparation are to be multiplied through demonstration and replication, they must first be shown to work, to be effective, and to lead to improved competence in personnel and, in turn, better educational programming for children.

With the establishment of minimum standards and the application of an appropriate evaluation methodology, there exists the potential for the shaping of the quality of professional preparation programs. Guidelines for training that set the standards by which programs are measured can aid the funding agency in discriminating between "excellent training" and merely "training."

Model Programs Funded by the U.S. Office of Special Education.

Those model programs whose success has been demonstrated can themselves be excellent training grounds for future teachers of the severely handicapped. The model/demonstration programs can provide the setting in which preservice and inservice personnel observe service to the handicapped, participate in that service, and join theory to practice in onsite internship.

Guidelines for Training: Minimum Standards

Any professional preparation program needs minimum standards against which its worth is measured. The ultimate test of the effectiveness of a program is the *success of intervention with children in a service setting*. At present, *no* unified acceptable set of standards exists to serve as guidelines. There have been *attempts* to set standards and we can examine several of these *approximations*. Some of the vital underpinnings of these approximations are presented here:

1. Perske, R., and Smith, J. *Beyond the Ordinary*. Seattle, WA: The American Association for the Education of the Severely/Profoundly Handicapped, 1977.
    a. There is a need for a set of rigorous training principles.
    b. Professional training must be rooted in *behavioral technology* and *systematic instruction*.
    c. Program should be *interdisciplinary* in nature.
    d. Same *competencies* should be exhibited by trainer and trainee.
    e. Adequate procedures for *measuring and proving competence* are essential.
    f. Trainees should be judiciously *recruited*.
    g. Competency-based curriculum is fundamental.
2. Burke, P. J., and Cohen, M. The quest for competence in serving the severely/profoundly handicapped: A critical analysis of personnel preparation programs. In E. Sontag, J. Smith, and N. Certo (Eds.), *Educational programming for the severely and profoundly handicapped*. Reston, Virginia: Council for Exceptional Children, 1977.
    a. Programs of study need to be seen in historical perspective.
    b. The history of litigation related to rights of the handicapped is a vital part of the curriculum.
    c. Programs should utilize resources of other professionals (i.e., should be interdisci*plinary*).
    d. The ability to work with parents (parent training strategies, parents resources) must be strong.
    e. Programs should utilize outside resources (local, state, national).
    f. Development of community-based services (playing an active role in the community) is important.

g. Personnel need training in administrative skills (*directing* and *coordinating* the *educational management team*); classroom organization (maximizing instructional time); *normal* child development as well as *exceptional* child development; medical basics (handling health problems, prosthetic strategies); *assessment* (use of formal instruments and informal tools); *applied behavior analysis* (research methodology, instructional procedures, functional analysis).

3. Wilcox, B. A competency-based approach to preparing teachers of the severely/profoundly handicapped: Perspective I. In E. Sontag, J. Smith and N. Certo (Eds.). *Educational programming for the severely and profoundly handicapped*. Reston, Virginia: Council for Exceptional Children, 1977.

   a. Those competencies required for teachers of the severely handicapped include management of the environment and implementation of instruction.
   b. Trainers of teachers need to be research-oriented.
   c. Programs must be *interdisciplinary* (drawing on resources outside of special education).
   d. There is a need for *field-based* training programs (true integration of theory and practice).
   e. University faculty need to move into the field.
   f. *Inservice* training is essential.
   g. Recruitment must be selective (look for talent and commitment).
   h. Programs need to motivate students (maintain enthusiasm and morale).

4. Horner, R. D. A competency-based approach to preparing teachers of the severely and profoundly handicapped: Perspective II. In E. Sontag, J. Smith, and N. Certo (Eds.). *Educational programming for the severely and profoundly handicapped*. Reston, Virginia: Council for Exceptional Children, 1977.

    - a. There is a need to specify competencies required (identification), to develop competency training modules (organization) and competency training sequences (sequencing).
    - b. Evaluation of teaching emerges from documentation of positive change in child performance.

5. Guidelines for the development of personnel preparation programs designed to train personnel to teach severely handicapped individuals, (unpublished paper). Nashville, Tennessee: Vanderbilt University, Southwest Regional Consortium, undated.
    - a. A program must document needs such as the need for training (are other programs available?), the resources available (practicum sites, teaching materials and media).
    - b. Programs must exhibit instructional integrity.
    - c. Coursework should include characteristics of the severely/profoundly handicapped, methods of instruction, curriculum considerations, assessment.
    - d. Ancillary/support personnel must be included.

Current Trends in Developing Such Standards in Training

1. Movement toward interdisciplinary cooperation, with expanded training to include other disciplines. Standards for training must also be applied to these disciplines.

2. Greater attention to the skills of the teacher as a coordinator of the educational management team in recognition that those who work with the severely handicapped work not in isolation but cooperatively with other professionals.

3. Evaluation of personnel with focus on the development and use of more precise instruments for measuring behavior and evaluating programs.

4. The development of fine instruments and the competency to administer those instruments, to record change, and to plan educational programs according to evaluation results.

5. Attention to the demonstrable skills of the teacher as a way of evaluating teacher effectiveness.

6. The use of *quantitative data rather than qualitative judgments as measures of success*.

EXISTING TRAINING GUIDELINES OR RULES OF THUMB

We can examine a variety of training models and see common assumptions among them, expressed as follows in ten pivotal premises:

1. Teacher training is *competency-based/performance-based*.

2. Programs focus on *quality* -- *recruiting* with *discrimination* and concentrating on producing a small number of highly trained professionals.

3. Training is *interdisciplinary*--calling upon the skills, expertise, resources of a broad spectrum of professionals.

4. Training has an extensive, *rigorous field base*, focusing on developing hands-on skills (within the theoretical context).

5. There is detailed, ongoing student *assessment* and *operationalizing of goals and objectives*.

6. *Specification of instructional procedures* is precise (including both reinforcement and correction procedures).

7. *Student performance data* are utilized for decision-making about program quality.

8. *Family members are involved* in planning, implementing, and evaluating program effectiveness.

9. Students are prepared for functioning in *community living* and work environments.

10. There is an enduring commitment to the concept of the severely *handicapped as learning, growing individuals* with the right to quality in education and working and living environments.

ANATOMICAL ANALYSIS OF FOUR PROGRAMS

Among the aggregate of model demonstration programs for personnel preparation funded by the U.S. Office of Special Education, many exhibit quality in their didactic and practical aspects, e.g., those conducted at the Universities of Illinois, Vermont, Oregon, Virginia, Maryland, and Iowa. For purposes of description in this paper, four programs were selected for detailed analysis by a small panel of professionals with expertise in the field of special education for the severely handicapped. The criteria used for selection included the following:

1. The training program provides preparation for teachers of children from birth to preschool;

2. Publications are available with information about the program;

3. The program includes both a preservice component and a model/demonstration component;

4. The program has demonstrated significant impact on the field of education for the severely handicapped;

5. The program has developed, over time, a heavily field-based orientation as opposed to merely a didactic approach;

6. The program emphasizes the use of educational management teams which are interdisciplinary in focus;

7. The program provides preparation through the doctoral level with attention to preparing graduates as trainers of teachers and as researchers;

8. The program provides formal liaison with state and local education agencies.

Table 1 presents the framework on which each program is built. A narrative description of the four programs makes the picture more complete. The descriptions are not intended to be comprehensive, but to speak to those specific characteristics considered by the panel to be crucial elements of a quality training program.

Table 1

Framework for Analysis of Four Programs

	University of Kansas	University of Washington	University of Wisconsin	San Francisco State University
1. DOES PROGRAM HAVE:				
- Infant program?	yes	yes	yes	in progress
- Neonatal intensive care units?	no	yes	no	yes
- Center or home based programs?	both	center-based	both	both
2. EARLY EDUCATION PROGRAM?				
- Integrated or segregated?	not yet integrated	50% integrated	totally integrated	not yet integrated
3. COMPREHENSIVE EDUCATIONAL SUPPORT AREAS PROGRAM?	yes	yes	yes	planned
- Developmental therapist?	yes	yes	yes	
- Communications disorders specialist?	yes	yes	yes	
- Family education service specialist?	yes	yes	yes	
- Nurse?	yes	yes	yes	
4. DOES PROGRAM TEACH BASIC SKILLS FOR:				
- Establishing entry behavior?	yes	yes	yes	yes
- Planning total instructional program?	yes	yes	yes	yes
- Writing instructional programs?	yes	yes	yes	yes
- Work with individuals?	yes	yes	yes	yes
- Work with small groups?	yes	yes	yes	yes
- Maintaining continuous records of child progress?	yes	yes	yes	yes
- Refining programs based on performance record?	yes	yes	yes	yes
- Using some form of decision rules?	yes	yes	yes	yes
- Program evaluation at least quarterly?	yes	yes	yes	yes
5. DOES PROGRAM TEACH COORDINATION OF TOTAL PROGRAM MANAGEMENT?	yes	yes	yes	yes
- Does student have experiences in planning total program for classroom?	yes	yes	yes	yes
- In developing instructional plans in context of comprehensive management plan?	yes	yes	yes	yes
- In utilization of paraprofessionals?	yes	yes	yes	yes
- In working with parents and parent instruction?	yes	yes	yes	yes

Table 1 (Continued)

6.	IS VOCATIONAL PROGRAM AVAILABLE?	no	yes	yes	no
	Does vocational program involve community opportunities such as:				
	- Independent use of public transportation?		yes	yes	
	- Use of community recreation facilities?		yes	yes	
	- Use of shops, grocery stores, department stores, restaurants?		yes	yes	
	- Wide variety of vocations coordinated with the community?		yes	yes	
7.	RATIO OF DIDACTIC TO PRACTICUM/INTERNSHIP	50/50	50/50	50/50	.40 didactic .35 practicum .25 internship
8.	TYPES OF PRACTICUM?	inservice retraining	summer workshop public schools	student teaching for undergraduates	6-8 hrs./wk. (public schools) grads
	TYPES OF INTERNSHIP?	elementary, preschool, secondary	public schools	administrative settings–grads.	30 hrs./wk. (public schools)
9.	HOW CLOSE IS SUPERVISION?	one-to-one in practicum	very close (once every 6 wks. or more often	close (4 times per semester)	(20% of time under faculty supervision (once a week)
10.	HOW MANY PERMANENT FACULTY FOR SEVERELY HANDICAPPED?	2	9.50	1	2
	- Special education	8	5.50	1	18
	- Other disciplines	1	4.00	2	6
11.	MEANS OF IMPROVING PROFESSIONAL PREPARATION PROGRAM	updating materials; revising curriculum	revision of workshop utilization of data for decisions	revising course outline; field-based faculty	updating mat'ls; re-designing of courses
12.	CAN PROGRAM BE REPLICATED THROUGH PUBLISHED MATERIALS?	yes	yes	yes	yes

Program: San Francisco State University

Although the professional preparation program at San Francisco State University currently offers few courses in work with infants, an Infant Program is being designed to begin in the fall of 1981 and the University is involved with the intensive care units of several area hospitals. The emphasis in programs for children between 0 and 18 months is on home-based parent education; programs for children between 18 and 36 months are classroom-based and located in public school settings.

All basic skills (Table 1, Section 4) are covered by the curriculum which teaches the students to develop individual educational plans, to sequence objectives in order to record child progress, and to use Trend-Line decision models. The basis of student evaluation is child change. In addition, students have practicum experiences in total program management.

By fall of 1980, a secondary severely handicapped program is expected to be in operation. Course work is now offered in this area, but it is not practicum-based. The vocational program, as planned, will include all community opportunities, although the resources are not yet available for a total program of vocational training.

In the main training program, intensive supervised practicum begins with a 6-hour-a-week placement, which is followed by a second, 9-hour-week placement. Student teaching is the final practical experience and that is a full-time (30-hour-per-week) assignment for 8 weeks under the general supervision of a master teacher, with faculty supervision 20 percent of the time. As the student progresses through the three stages of practical work, the supervision becomes less intensive. Steps are now being taken to increase the supervision at the level of the final student teaching experience.

San Francisco State University continually improves the professional preparation program by means of regular staff meetings for updating information and making program changes. Program changes are also based on feedback from graduates of the program who are now teaching in public schools. On the basis of such input, courses are redesigned each semester.

Program: University of Kansas

In the University of Kansas' professional preparation program there is no distinction between the Early Childhood and Elementary divisions. Students get experience working with children age two through preschool, as well as with infants and "at risk" children in special labs. Early education demonstration facilities are located at the Medical Center in Kansas City and in public home-centered preschool programs in Kansas City, Missouri. Although these programs are currently segregated, integration is foreseen in the near future.

All basic skills, as listed in Table 1, Section 4, are included in the program's Individualized Curriculum Sequence Strategy. Rooted in the combination of developmental and operant theory, the program cuts across classes of behavior and focuses on behavioral sequences in natural settings or environments. The emphasis here is on sequence and age-appropriateness. Thus, the content of the curriculum is traditional, while the form is unique in its more functional nature.

It is through the practicum that students have the opportunity to coordinate a total educational program, usually taking over the entire classroom by the end of their third practicum. Work with parents is important, although its intensity differs with each practicum site. The preschool center, for example, has a strong parent program. In no case, however, do the students work in the homes of the children.

A vocational program is not available now, since most of the older children and youth have been previously institutionalized. Now that the younger handicapped children are moving up through the school system, the need for vocational training is beginning to grow. Several of the University's graduate students are interested in young adults and vocational preparation, and they are placed in appropriate practicum sites where all opportunities for community use are provided.

Student performance is evaluated in a variety of ways. Formal evaluation is done through questionnaires filled out by graduates of the program and their supervisors. Performance in all basic skill areas listed in Table 1, Section 4, is monitored by the grading system because the granting of college credit for courses is determined by student achievement.

Inservice re-training is important since students need the state teacher certification which results from this professional preparation program; the teacher's own classroom is, thus, the practicum site. There is no distinction between practicm and internship. Internship takes place in classrooms at all levels, with the exception of vocational classrooms. Close supervision in both practicum and internship takes the form of on-site observation and written material.

Continuous improvement of the professional preparation program is the result of feedback from graduates who help with revisions of the curriculum--both the informational content and practical elements--each semester and with updating materials used in courses.

Program: University of Washington

The University of Washington's program is essentially center-based utilizing the public schools and some state institutions. Children and young people served in these settings, about 50 percent of which are integrated, range in age from birth to 21 years.

Basic skills are emphasized in the training program, the assessment of pupil performance being one of the major focus areas. Students learn the mechanics of writing educational procedures and guidelines for educating and evaluating handicapped pupils, and they use data decision rules as they analyze performance data to determine progress and modify individual education plans. Reassessment of pupils' needs takes place at least twice a year by means of the Uniform Performance Assessment System (1978), a curriculum-referenced assessment instrument based on normal sequences of child development. The coordination of the educational program is heavily emphasized and students are responsible for planning pupils' classroom time in the practicum.

Vocational programs are available in the summer workshop and in on-site settings for the severely handicapped. In these, the wide variety of available vocations are closely connected with the community. Sessions are provided during the summer workshop to train students for long-range vocational planning for handicapped youth.

All areas of trainee performance (Table I, Section 4) are evaluated. Specific criteria must be achieved by the trainee in order to receive passing grades. Observation, pre and post tests, optional assignments, and contracts to fulfill certain requirements are all used as tools for evaluation of student performance.

Trainees undertake closely supervised practica in the summer workshops, in public schools, and in classrooms of the University's Experimental Education Unit. The internship experience is offered both in the public schools and at the Experimental Education Unit. For students in Early Childhood Education of the Handicapped, several practicum sites are available, including the neonatal intensive care unit of the University's Hospital and the Congenital Defects Center of Children's Orthopedic Hospital and Medical Center. In addition, the Experimental Education Unit offers two settings for practical work with infants, the Infant Program for the Severely Handicapped and the Down's Syndrome Infant Program. School-aged children are served both at the Experimental Education Unit and in two field sites of the Seattle Public Schools.

Graduate students accrue extensive experience with a variety of demonstration and research projects where they may be assigned or employed. For example, at the Center for the Severely Handicapped-Outreach, they work with 15 public school districts in Washington State. Other projects deal with evaluating the severely handicapped and with instructional hierarchies research. Thus, graduate students have a broad spectrum of practica in well controlled settings in which the severely handicapped are served.

Improvement of the professional preparation program derives from several sources as the staff develops and refines effective instructional intervention. A pre and post test are administered to trainees. Also, during the summer workshop, participants give informal feedback and supervisors make observations which contribute to the annual revision of the workshop. After the workshop, written questionnaires and group feedback sessions supplement the data gathered from more formal testing methods. In this way, improvement of the program is continuous.

Program: University of Wisconsin

The Infant Program at the University of Wisconsin, which has both center-based and home-based components, includes children from birth to 8 years of age. Infants are screened for all problems, including but not limited to severe handicaps. The Early Education Program is a totally integrated one whose classes are located in regular elementary schools.

Basic skills (Table 1, Section 4) are all covered in this professional preparation curriculum. Students use an ecological inventory to identify objectives and to develop individual education plans. Child progress is monitored through a variety of measurement strategies because students have been trained to write task analyses using four or five of the strategies. Decisions about change are made not on the basis of one systematic formula, but on a variety of dimensions. Evaluation takes place on a continuous basis, and a series of graphs for each behavior show criterion points reached. At any given time, one can identify the skills acquired. Weekly review of these graphs provides ongoing evaluation.

The practicum is the setting in which students have the opportunity for planning and, by the end of each practicum, the student is responsible for the total instructional program. Here, too, work with parents and families is heavily emphasized.

The vocational program is a sizable component of the University of Wisconsin's curriculum. Youngsters between the ages of 10 and 21 are served in community-based work-training sites that are totally integrated with the community. A variety of skills are called upon in use of transportation, restaurants, stores, and other community resources. In addition, a program of domestic skills training is in progress.

Student performance is evaluated through formal observation and weekly feedback by the cooperating teachers and supervisors of the students in the practicum sites. Evaluation is based on demonstrated abilities in all of the basic skill areas mentioned in Table 1, Section 4.

For undergraduates, the practical application of theoretical coursework takes place in the student teaching experience. Graduate students participate in an internship program geared to interdisciplinary or administrative settings. In both cases, supervision is close.

The improvement of the professional preparation program is the result of input from teachers in the school system as they work with the student teachers from the program. This feedback leads to the constant refinement of the curriculum. In addition, two teachers from the public schools (field-based personnel) actually teach some courses at the University, thus acting as monitors of relevance.

SUMMARY AND CONCLUSIONS

This chapter has, thus far, reviewed the history of professional training for teachers of the severely handicapped, pinpointed some of the needs for training, and indicated the kinds of training that now exist. It has shown that severely handicapped individuals can be properly served only by professionals who are adequately prepared to meet their unique needs. To ensure this, training programs of the highest quality are essential. A call for standards has come from among special educators and, as we have seen, some approximations have been forthcoming to answer that call. An examination of several training models has allowed us to enumerate some of their common assumptions.

Four federally funded professional preparation programs were reviewed in detail in order to highlight those areas considered the sine qua nons of a quality training program. A glance at the questions posited in Table 1 reveals the author's conception of what constitutes "good training." If we wish to heed the call for minimum standards for high quality training, we need only turn to those model/demonstration projects which are engaged in the successful preparation of personnel to work with the severely handicapped. Four critical elements must form the cornerstones of programs of excellence.

Comprehensive Educational Management Team

The most important common denominator is the basic commitment to a comprehensive educational support team. In all four universities, an interdisciplinary program (in effect or planned) gives students theoretical and practical experience with professionals in disciplines relevant to the teaching of the severely handicapped. Because the special educator must draw on the additional support and expertise of other specialists in the field, he or she must be trained in the total management of this interdisciplinary educational team. Under the competent leadership of the teacher, the team combines forces to deliver the most intensive and comprehensive services available to the severely handicapped pupil.

Integrated Programs

All professional preparation programs should produce personnel whose skills lead to the maximization of the handicapped individual's adaptation to the natural environment, that is, the environment of home and community with all the rich resources that they offer. The four programs described here are all engaged in the attainment of that goal. A fundamental and necessary requirement is that a response must be taught in the environment in which it will be used. In integrated settings--in the home, the regular school system, the community--the severely handicapped have the opportunity to learn the skills they need in order to become contributing members of their communities. And, in this integrated context, potential teachers of the severely handicapped develop their skills in the same setting in which they will later work.

Basic Skills

The common theoretical approach of these professional preparation programs is behaviorism. The strategies emphasized in the training programs--both for research purposes and for the practice of teaching--are influenced by the very nature of severely handicapping conditions. The difficult task of developing educational programs for children with such unique kinds of handicaps has resulted in curricula that stress applied behavioral analyses. In the four cases examined here, there is a tendency to combine behavioral intervention and assessment with Piagetian-based developmental concepts in the curriculum for the early years. For older children, there is a heavy reliance on the functional approach to the skills that are taught. The crucial issue is that students be taught skills which increase the independent functioning of the individual within his or her natural environment. Since the classes of behaviors cut across disciplines, the need for a comprehensive educational management team is clear. Teachers come to their task armed with a solid foundation in theory, their basic skills honed by relevant experience in the field.

Field Based Programs

We have seen in the four programs the general tendency toward using service settings and field sites in combination with didactic course work on the college campus. The kinds of behaviors which must be built and developed in competent teachers require that at least 50 percent of trainees' time be spent in intensive supervised practicum/internship in the field. An overemphasis on the didactic to the exclusion of supportive field-based work can only produce teachers whose orientation is strictly theoretical. The sharpened skills necessary for the demanding task of teaching the severely handicapped and for the sucessful management of a total educational team can only be gained in the daily application of those skills in a service context.

Future Issues, Directions and Research Needs

In almost any professional preparation program, training lags behind research. However, training should be representative of current thinking in the field.

Building those skills necessary to teach and to coordinate the total program for the severely handicapped requires a great deal of actual practice in high quality service programs. At San Francisco State University, the head of the Special Education Program, Wayne Sailor, has been developing a three-part program to train teachers of the severely handicapped that reaches for just such high standards of quality.

The program, which is designed for credentialed teachers working toward a specialty credential, consists of 5 courses or 15 units within the severely and multiply handicapped core area. Parts I and II each consist of semester-long six-unit blocks of two courses plus a three-morning-a-week practicum in a class for the severely handicapped. The classes are taught in the natural setting of developmental centers for the handicapped, chosen for their central location and convenience for the largest number of inservice students. Both preservice and inservice teachers are combined in an average class of 20, the ratio being about 8 preservice to 12 inservice. Since classes take place during the regular school day so as to take advantage of the real environment of the natural setting, school districts offer released-time to the teachers through the use of substitutes. Reimbursement for the substitute teachers comes from the college's federal grant. The format of the class consists of a combination of the following:

a. Straight lecture

b. Some audiovisual aids

c. Consultants

d. Moving into classrooms for demonstration

e. Individual children brought into the class

f. Workshop demonstration by experienced teachers in other schools

The attempt is made to maximize exposure to other teachers' classrooms so that students can observe a variety of methods and programs with the widest possible experience in school situations.

To achieve the comprehensive professional preparation necessary to teach the severely handicapped, it is essential that students have experience with support professionals. In service settings, it is the role of the teacher to serve as coordinator of the total program. Therefore, the information and the skills which are fundamental to the coordination of other professionals must be included in the preservice experience.

Another crucial issue is that most of the professional preparation required to meet the ever increasing demand for qualified (i.e., certified) teachers is currently being provided by some form of inservice training. Many professional trainers, such as Sailor and Brown (1980), are expressing a certain measure of dissatisfaction with the effectiveness of their own inservice training efforts. It is incumbent upon us to re-examine, throughout training programs, the influence that inservice training has on increasing the skills of teaching and utimately the quality of service to severely handicapped children.

Precise evaluation of the effectiveness of both preservice and inservice professional preparation is desperately needed. As professional trainers, we repeat year after year the same content and utilize the same training strategies with little performance data to support these rituals. We must do more. We must demonstrate the effectiveness of our interventions by measuring outcomes in terms of teacher competence and positive learning growth in severely handicapped pupils.

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EVALUATION

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This chapter examines the general purpose of evaluation and more specifically, the types of evaluation suitable for programs serving severely handicapped learners. The chapter discusses evaluation issues unique to model programs serving the severely handicapped which are funded by the U.S. Office of Special Education (formerly the Bureau of Education for the Handicapped) and probes some funded programs as examples of evaluative efforts.

ANALYSIS

Purpose and Types of Evaluation

The purpose of evaluation is to gather data which will provide information for decision making (Mitroff and Bonoma, 1978; Sheehan, in press). This definition, however, becomes operational only when the evaluation process is linked to specific decision makers. The decision maker dictates the types of data which must be gathered so that adequate information is available to answer the necessary questions.

Examination of each potential decision making audience is worthwhile as a means of discussing the types of evaluation suitable for programs for the severely handicapped. In discussing evaluation from the perspective of any single audience, one must remember that a number of different audiences usually have to be satisfied concurrently. For instance, the teacher needs to know how well a student is doing in class to make decisions about the educational program. The administrator also needs to know how well students in general are progressing in the teacher's class, but the level of detail needed by the teacher and by the administrator is considerably different. Similarly, both the state agency responsible for overall supervision of the severely handicapped program and the state legislature that funds the program may also be interested in progress of students, but again the level of detail and the method of data presentation will be different. It will become apparent that multiple measures at almost all levels will also be desirable in order to meet the requirements of qualifying as a demonstration program. Irvin, Crowell, and Bellamy (1979) present a rationale for multiple assessment evaluation for programs for severely retarded adults, and the principles discussed therein apply equally well to the necessity for multiple evaluations for all programs for the severely handicapped.

Audience Analysis

Let us examine the types of evaluation that each level of audience might need to have sufficient information to make decisions:

Direct service provider. This audience is comprised largely of teachers or group home providers. In general, the immediate service provider is primarily interested in student performance data. These data can take a number of forms, including simple change scores comprising performance at the beginning and end of the school year, pre-post data, probe data collected at periodic intervals during the teaching year, or direct and continuous measurement which can be used for daily decisions about student performance. With pre-post data, and often with probe data, the evaluation is summative and allows the decision maker (in this case the immediate service provider), to know only at the end of a period of instruction how well the student has performed. Theoretically, then, this sort of information would be used to make decisions about the student's program for future years or future periods. Other service providers gather continuous monitoring information in order to make data-based program modifications. Thus, evaluation is more formative, and decisions about the educational future of a student are made daily.

When employing pre-post evaluation design for programs serving the severely handicapped, the evaluator is confronted with a choice between norm-referenced and criterion-referenced instrumentation. In general, norm-referenced devices do not yield useful information to the direct service provider. White (in press) makes the point that even in a school district of 20,000 students, it is quite unlikely that more than one, two, or three severely or profoundly handicapped pupils could be found who matched each other reasonably well on even the most obvious educationally relevant variables. Even with a large population of severely handicapped students, such matching would not be feasible because of the inherent heterogeneous nature of severely handicapped people. When one is measuring a population which manifests an infinite variety of motoric limitations, covers the expressive language range from mutism to talking in sentences, displays self-help skills that vary from needing complete support to a high degree of independence, suitable and valid norm-referenced instrumentation simply does not exist. Moreover, the chances of valid instruments being developed are remote. Consequently, when evaluating the progress of severely handicapped students, criterion-referenced instrumentation has been the preferred type of evaluative measure. Criterion-referenced measures are usually related to the curriculum being taught, although there are some examples of criterion-referenced measures that have been adopted widely by a number of projects and yet have not been related to a specific curriculum. The Uniform Performance Assessment System (UPAS) (Bendersky, 1968) is one such example. The state of Oregon's Student Progress Record (1978) is an example of a criterion-referenced instrument that is used for all developmentally disabled programs in the state of Oregon, where a variety of curricula are used.

The immediate service provider should be concerned with types of evaluation other than student progress. For instance, the quality of the performance of an aide or teaching assistant in the classroom should be of primary concern. The teacher must develop standards for the aide's performance and periodically evaluate the aide's performance. These evaluations yield information about the type of inservice training the teacher must provide for the aide. A similar system of standard-setting and evaluation would be needed for volunteers if they were used in the instructional setting (Fredericks et al., 1979).

The teacher may also be concerned about the degree of parental participation in the program. If the parents volunteer in the program, then their participation must conform to the same criteria developed for non-parent volunteers. If the parents are participating in groups, evaluative processes must be developed to determine the effectiveness of those groups and to modify them if they are not effective in achieving stated outcomes. Parents may be conducting home programs, and evaluation methods to determine the effectiveness of those programs must be designed.

It is clear that, at the service provider level, a variety of measures are needed: student progress; teacher, aide, and volunteer performance, and parental involvement. Many specific measures exist for each of these program components. For instance, evaluations of performance gains across a variety of curricular areas are made to measure student progress. In addition, a periodic assessment can be made to determine whether a satisfactory number of individual programs is conducted daily, whether data are analyzed appropriately, and whether group programs are conducted as scheduled in the prescribed manner. The more sophisticated the program, the more measures will be taken.

Parents. Parents of severely handicapped children served in demonstration programs constitute a fourth evaluation audience. The parent will be most concerned with child performance data and appropriateness of the program for the child. The child-change data presented to the parent may be similar to that used by the immediate service provider.

Program administrators. This third audience is most often comprised of building principals or district superintendents. This group of decision makers is also concerned with child-change data, but need it only in summary form. Methods of synthesizing and summarizing individual data maintained in classroom programs must be developed to provide this audience with functional information. Such data can provide information for inservice training and program modification. The administrative audience will also be concerned with the performances of the immediate service providers; therefore, evaluations of staff performance must be available. Finally, at this level, the cost effectiveness of the program becomes a concern.

Funding agents. The bureaucratic arms of the government such as the State Department of Education, the Mental Health Division, the Developmental Disabilities Division, and the legislature of the state constitute another evaluation audience. This group will be interested in program effectiveness measured by the degree of child-change reported in summarized form, but will have a major focus on cost and cost-effectiveness data.

A rather unique evaluation audience is the Joint Dissemination Review Panel (JDRP) at the U.S. Department of Education. The JDRP examines data from federaly funded projects. The JDRP generally approaches the evaluation of projects in a traditional way, examining child-change data usually in a group design format, although it has recently accepted a single subject design project for validation. The panel desires the presentation of data from comparison groups or other proof that child-change is occurring at a pace faster than would normally occur through maturation. Although statistical significance in child-change data is important, it must also be demonstrated that these changes are educationally significant. The definition of educational significance is idiosyncratic to the population and educational program being considered. For instance, when presenting to JDRP statistical child-change data for a severely handicapped program, it is necessary to describe the types of behaviors being acquired by the child that these statistical data represent.

Accountability. It is appropriate at this point to insert a word about accountability because in the minds of many, accountability is linked inextricably to evaluation. This linkage is valid at every level. The parent and administrator, by tracking the progress of the child, hold the service provider accountable for the degree of progress. The service provider, through observation of his teaching assistant and volunteers, holds them accountable for their performance. Administrators, bureaucrats, and legislators are concerned that they "are getting their money's worth" and that child progress, which must be demonstrated, is not bought at too high a price. Accountability does not necessarily have to be the prime purpose of evaluation, but accountability cannot occur without evaluation.

Evaluation Issues for Model Programs

While programs for the severely handicapped must relate to all of the audiences above, those projects which are funded by the U.S. Office of Special Education must meet several additional criteria to earn the designation "model program." The first requirement is that the program, since it is a model, must be able to clearly identify those components that constitute the model and make it unique. A second element is that the model must be exportable in the sense that others can learn the essential components and implement them. A model, by its definition, dictates that others must be able to copy its essential characteristics or components. A criterion level for these components needs to be specified so that the quality and degree of implementation of the component can be measured. Since a model should be able to demonstrate its replicability, there is a need to prescribe, at some point along the model's development (and hopefully sooner than later), the method by which others are to be trained to implement various components of the model. The evaluation of this training needs to be as stringent as the evaluation for each of the model components individually. Standards and criterion levels need to be precisely prescribed.

Training to implement a model can take a variety of forms: materials that others can study, workshops in conjunction with materials, or actual on-site training with detailed assistance in the implementation of the model. Regardless of which of these training methods are used, there are four elements of evaluation that must be addressed.

The first evaluation component examines trainee satisfaction. How much did the people being trained, by whatever methods, like what was happening to them? Did they think the training was appropriate? This evaluation is usually accomplished by a questionnaire or some type of interview. Although this is the least significant type of dissemination evaluation, it is essential because, if trainees do not like the training, they are unlikely to implement the model.

The second element of evaluation determines what the trainees learned while they were going through training. What did they learn from the reading documents or attending the workshop, or from actually going through an intensive training period? Objectives must be prescribed and methods of testing the trainees' acquisition of knowledge or skills must be determined.

The third aspect of training evaluation examines the trainees' implementation of the knowledge, techniques, and methods in which they were trained. This phase focuses on the fidelity of transferring essential components of the model. Trainees can adapt the model in part or in whole, but each model component must be identified, criterion levels established, and measurement of fidelity of implementation devised.

The final phase of evaluation looks at the degree of child-change occurring as a result of the trainee's implementation of the model. This is, perhaps, the most difficult type of evaluation to obtain and yet is the primary purpose for the entire dissemination effort. There must be careful attention to determine whether child-change has occurred as a result of training by the model site.

Thus, any project funded by the U.S. Office of Special Education (OSE) should have an evaluation plan for each component of the model as well as an overall evaluation of the project. In addition, the model project should undertake a comprehensive evaluation of its dissemination efforts. Without this type of evaluation plan, it would be difficult after assessment to conclude that a model was, in fact, a model and that it was indeed effective.

APPRAISAL

Funded Model Project Examples

In the majority of funded projects examined, we found that projects did an excellent job of documenting child-change. In most cases, however, the identification of the essential components of a model was difficult. While a project might indicate it was developing a comprehensive classroom model, it would submit as its only evaluation excellent child-change data. However, components of the classroom model were neither identified nor evaluated; thus, there was nothing in the final report to indicate unique qualities and critical elements of that classroom model or how others might implement it to achieve the same degree of child progress reported.

In all fairness, such projects may publish such information separately. However, the specification and evaluation of individual components is necessary if the full impact of the project model is to be realized.

Rather than focus on shortcomings of various projects, it would seem more useful to examine the evaluation designs of several projects which exemplify the criteria we have delineated above. All three projects have been funded by the U.S. Office of Special Education and serve as examples of excellent attempts to achieve quality program evaluation. The Specialized Training Program, the Achievement Place Model, and the Teaching Research Severely Handicapped Data-Based Classroom and Inservice Training Model all represent state of the art program evaluation.

STATE OF THE ART

The Specialized Training Program (Bellamy, 1978) provides a rather unique day program for severely handicapped adults. Its evaluation plan is exemplary because of its comprehensiveness. The evaluation activities of the model address three objectives of the project:

> Objective 1: Documentation of the utility and replicability of the Specialized Training Program (STP) models in eight diverse communities in the Northwest and in two communities outside the region.
>
> Objective 2: Evaluation of the effectiveness of programs using the STP model to combine vocational and non-vocational social developmental services.
>
> Objective 3: An analysis of the cost of the specialized training program model as compared to alternative community services.

The evaluation studies involved collection of data from 11 different sources. Three of these involved summarizing ongoing data collected within each program; two are widely used standardized tests; three are instruments developed in field test research with the STP model for which considerable data are now available to describe methodological characteristics; and three are instruments that were developed specifically for the project. Tables 1, 2, and 3 summarize the evaluation plan for the STP model.

TABLE 1

EVALUATION PLAN FOR OBJECTIVE I: Documenting the Utility and Replicability of the Specialized Training Program Model

Evaluation Issue	Evaluation Question	Data Source (Instrument)	Measure	Timeline for Collection/Summary	Use of Information
1. Replicability of the Model	Can all components of the STP model be implemented in diverse community settings?	STP Model Implementation Checklist	Percent of components implemented in each site	Every six months	FORMATIVE - improve model implementation by sites - increase relevance of model through appropriate modifications SUMMATIVE - evaluate utility of STP Model in diverse settings - identify factors that affect model utility
2. Characteristics of Individuals Served	What intellectual, physical and behavioral handicaps are characteristic of individuals served?	- Standardized IQ tests - Program referral - Adaptive Behavior Scale	- intelligence quotients - lists of handicapping conditions - percentile scores on ABS	At program entry for each person served	FORMATIVE - insure that services are provided to severely handicapped individuals SUMMATIVE - describe individuals served in replication sites. - identify relationships between type of handicap and model effectiveness
3. Perceptions of Local and State Purchasers of Service	How do agency representatives who purchase services from replication sites and representatives or advocates of clients rate satisfaction with program?	Structured rating via telephone interview with service purchasers and advocates	Likert scale satisfaction ratings with program objectives, methods, staff and results	Every six months	FORMATIVE - increase replication site responsiveness to local needs - increase relevance of the model through appropriate modifications SUMMATIVE - determine degree of satisfaction of local service purchasers and client advocates - evaluate agency differences (DD, VR, welfare) in satisfaction.
4. Social Validation	How do replication site staff rate the utility of model components?	STP Model Utility Checklist	- % of components rated as effective - % of implemented components rated as effective	Every six months	FORMATIVE - identify misunderstandings in model implementation - improve both model structure and local replication SUMMATIVE - determine overall staff satisfaction with the STP Model - identify model elements related to staff concerns and turnover
5. Access to Work Opportunity	Does the business strategy for the STP model result in an adequate supply of appropriate work?	Monthly computer reports on production	- Number of different tasks available - Total dollar volume of production - Proportion of work completed by target work force - % time spent on remunerative production tasks	Monthly, with summary every six months	FORMATIVE - adjust business strategy to insure work supply - assist all sites so that 70% of all work is completed by target work force SUMMATIVE - evaluate utility of business strategy - identify factors affecting differential effectiveness of business strategy

Table 2

Evaluation Plan For Objective II: Evaluating the Effectiveness of Programs That Combined Vocational With Non-vocational Social Developmental Services

Evaluation Issue	Evaluation Question	Data Source (Instrument)	Measure	Timeline for Collection/Summary	Use of Information
1. Social Developmental Skill Acquisition	Do participants in replication sites achieve objectives stated in individual plans?	Task analysis data sheets	Number and description of skills acquired	Continuous, with summary every six months	FORMATIVE - public local and state accountability for service effectiveness - improve procedures for setting and reaching individual objectives SUMMATIVE - evaluate the effectiveness of social developmental services provided by the model
2. Vocational Skills Acquired	How many and what kind of vocational skills are developed by participants in replication sites?	Task analysis data sheets	Number and description of skills acquired	Continuous, with summary every six months	FORMATIVE - public local and state accountability for vocational training effectiveness - improve procedures for setting and reaching individual objectives SUMMATIVE - evaluate the effectiveness of vocational training services provided by the model - identify factors affecting differential acquisition of vocational skills
3. Wages and Total Commercial Revenue Generated by Workers	What wage levels do participants achieve in STP replication sites?	Monthly computer reports on production	- Worker wages per month - total worker generated revenue (wages + overhead) per month	Monthly with summary every six months	FORMATIVE - identify subcontract and worker skill needs at each replication site - assist project in optimal use of business support resources SUMMATIVE - determine average worker wages in STP replications - compare to national data on sheltered workshops and work activity centers
4. Supervisor Perceptions of Individual Progress	Do supervisor ratings of individual skills change with extended program participation?	Supervisor Checklist	Summarized ratings of social skills, independence, vocational competence and supervisor satisfaction	Every six months	FORMATIVE - identify individuals whom supervisors feel need program improvements SUMMATIVE - determine whether supervisors view individuals as progressing over time - identify factors that contribute to supervisor satisfaction with individual workers
5. Impact on Participants Daily Activities Outside Work	How do participants' daily activities change with extended program participation?	Telephone Interview for Living Environments	Summary scores reflecting: 1) social behavior 2) independence 3) deviant behavior 4) caregiver satisfaction	Every six months	FORMATIVE - identify critical areas for program intervention SUMMATIVE - identify changes over time in daily behaviors - identify factors affecting caregiver satisfaction ratings
6. Effect on Labels Used by Caregivers	What labels are used by parents or primary residential caregivers to describe program participants?	Becker Adjective Checklist	Factor scores denoting perceived degree of 1) withdrawn; 2) tense; 3) non-compliant; 4) disruptive; and 5) incompetent	Every six months	FORMATIVE - Determine knowledge and impact of program results on caregivers SUMMATIVE - identify changes over time on labels used by caregivers.

Table 3

Evaluation Plan For Objective III: Conducting a Study of the Costs of the Specialized Training Program Model as Compared With Alternative Community Services

Evaluation Issue	Evaluation Question	Data Source (Instrument)	Measure	Timeline for Collection/Summary	Use of Information
1. Public Cost of STP Replications	What is the cost per worker of starting and operating STP replications? What factors contribute to individual and program differences?	Monthly computer reports on financial status	Cost per worker per month	Monthly	**FORMATIVE** - more precise specification of resource needs in future replications **SUMMATIVE** - documentation of average cost per workers in STP replications - comparison of public support needs with other programs serving similar individuals or achieving similar effects - documentation of average cost per worker in STP replications - identification of factors related to differential costs among workers or sites
2. Mix of Public and Commercial	What proportion of program operating costs are met by commercial revenue?	Monthly computer reports on financial status	Total public and commercial revenue generated by each individual in each site	Monthly	**FORMATIVE** - adjust costs to work across individuals, sites - accountability to local and state funding agents **SUMMATIVE** - determine mix of commercial and public revenue in STP replications - identify individual and site factors affecting this mix - compare the mix to data on work activities centers and regular program workshops in the region and nation - identify excess costs of commercial activity as compared to non-vocational ADPs
3. Economic Contribution to Community and Society	What is the economic impact of STP replication sites on the economy of local communities?	- Monthly computer reports on financial status - SSI, SSDI, welfare distributed to each client each month	- Public dollars entering local economy - Commercial dollars entering local economy - Worker wages entering local economy - Decreases in SSI, SSDI and state welfare payments	Monthly records with six month summaries	**FORMATIVE** - assist in site responsiveness to local economic needs **SUMMATIVE** - identify contribution to local economy of publicly supported and commercial aspects of replications - document decreases in SSI, SSDI and state welfare payments

In essence, the project trains people in the model at the site in Eugene and then follows up their performance in the field. Although not shown in Tables 1, 2, and 3, the project also gathers data as to the effectiveness of trainees during training.

An examination of Table 1 shows evaluation issue Number 1 (Replicability of the Model) measures the percent of components implemented in each site using the STP Model Implementation Checklist. The checklist follows the content of the STP operation manual which specifies the particular components necessary for implementation of the model. The checklist allows comparison of the business, habilitation, management, and organization procedures of the program with those specified in the manual. The checklist is used by the facility planning team to determine the system's needs and/or procedural recommendations for the program and is used to evaluate the level of model implementation. The level of implementation is indexed by the percent of checklist items the team finds to be consistent with the STP operation manual. Thus, not only have the model components been identified and techniques devised for measuring their effectiveness, but a system of checking the quality of implementation by adopters has also been developed.

Evaluation Issue 3 (Table 1) examines the perceptions of the local and state purchasers of service. Do they like what they are doing as a result of the training? Is it the type of model that they want?

An examination of this entire evaluation plan indicates that the model has identified the components that are essential for implementation. In its dissemination efforts, it fulfills all our components of evaluation for project dissemination. It determines whether people who are trained like what is happening to them and find that it is worthwhile. While in training, measures are taken on them to determine that they have acquired skills. Third, when they return to their own sites and implement the model, measures of the implementation of each component are made and compared to criterion levels. Finally, Objective 2 (Table 2) tries to analyze the effect on clients and provides data for that effectiveness. Thus, the STP model provides a comprehensive evaluation plan which meets the requirements of a model program.

A second model with exemplary evaluation is the Achievement Place Research Project. Achievement Place was developed as a community-based behavioral intervention program for the treatment of delinquents within a group home setting. The goal was for humane, effective, and practical treatment procedures that could be replicated by group home programs in other communities.

Since 1967, Achievement Place in Lawrence, Kansas, has served as the prototype program from which has developed the Teaching-Family model of group home treatment. The treatment model is grounded, in part, in behavior theory and is based on the premise that deviant behavior might be reduced or prevented by providing youths with requisite social, academic, and self-care skills as well as the motivation, relationship, development, and youth advocacy procedures applied by a married couple (the teaching parents) in a structured family setting.

Over the past several years, many of the treatment elements (components) have been subjected to careful experimental evaluation. These investigations have demonstrated the effectiveness of the token system (Phillips, 1968); the self-government system (Fixsen, Phillips, and Wolf, 1973; Phillips, Phillips, Wolf, and Fixsen, 1973); the teaching procedures used to develop the youths' social, academic, and self-care behaviors (Maloney, Harper, Braukmann, Fixsen, Phillips, and Wolf, 1976; Minkin, Braukmann, Minkin, Timbers, Timbers, Fixsen, Phillips, and Wolf, 1976; Werner, Minkin, Minkin, Fixsen, Phillips, and Wolf, 1975); the home-based report card system (Bailey, Wolf, and Phillips, 1974; Kirigin, Phillips, Timbers, Fixsen, and Wolf, 1977); and vocational training procedures (Braukmann, Maloney, Fixsen, Phillips, and Wolf, 1974).

Since 1972, the model has been disseminated to other community-based group home programs through the development of a year-long training sequence designed to provide couples with the necessary skills to operate the treatment program (Braukmann, Fixsen, Kirigin, Phillips, Phillips, and Wolf, 1975).

Many of the training procedures employed at Achievement Place have also been evaluated to determine their effectiveness in teaching the trainees the desired skills (Kirigin, Ayala, Braukmann, Brown, Minkin, Phillips, Fixsen, and Wolf, 1975; Willner, Braukmann, Kirigin, Fixsen, Phillips, and Wolf, 1977). In addition, the project has attempted to evaluate the effectiveness of its treatment program, not only in its original site, but in later replications. The focus of this research was on the effects on the children served. The research examined the first two attempted replications of the model, 12 later replications, and 9 conventional community-based programs in Kansas.

Thus, we note that the Achievement Place Model has systematically examined its various components. It has developed a training program in which trainees are evaluated during training and then has established the Teaching-Family models for group homes in a number of different sites. Finally, it attempted to analyze the results of its replications for a period of time. It should also be emphasized that during the implementations of the replication site, a great deal of formative evaluation is conducted. In fact, the first three months following the workshop in which the Teaching-Families are trained constitute a practicum and evaluation period. During this time, the trainees are operating programs in their respective communities and are in frequent telephone contact with the training staff a the University of Kansas. Rating scales are completed by the programs' consumers, namely the youth, the parents, the personnel in juvenile court, the welfare department, and the schools. In addition, a professional evaluator makes on-site evaluation of the program. This on-site evaluation determines how well the program has implemented the essential elements.

Thus, the Achievement Place Teaching-Family model group home treatment for delinquent youths also fulfills the requirements for a model program in that it has specified its elements for components and has conducted the four levels of evaluation: consumer satisfaction, evaluation of trainees while undergoing training, implementation of the model in place, and student change.

A final model program to be described is the Teaching Research Data Based Classroom. The Teaching Research Data Based Classroom (Fredericks et al., 1979) for school-aged severely handicapped children began as a demonstration classroom in an OSE-sponsored severely handicapped project. As such, it identified essential components of the classroom model:

1. The teacher serves as a manager of the classroom environment.

2. The aide conducts group programs with the children in the classroom.

3. Volunteers are used to provide one-on-one instruction in the classroom.

4. A task analyzed curriculum is available for all skills to be taught.

5. Continuous data are maintained on each child's progress in skill acquistion.

6. Behavior programs are established when necessary.

7. Maintenance data are gathered for each learned behavior.

8. Parents are involved as volunteers or to conduct home programs.

Each of the above components has a series of subcomponents which have established criterion levels of performance and each is measured on a prescribed schedule in a certain way. For instance, the component of volunteers has five subcomponents, each of which is evaluated according to prescribed criterion levels. They are as follows:

> Item: Number of volunteers. Procedure: Obtain the total number of volunteers from the teacher. Divide this number by the total class hours to get the average number of volunteers per hours. Criterion: Three volunteers for every 10 students per hours.
>
> Item: Scheduling of volunteers. Procedure: Check 4 volunteers during the morning and note whether they are doing assigned tasks. Criterion: 3/4 or 75% of volunteers are on task.
>
> Item: Delivery of cues, consequences, and collection of data by volunteers. Procedure: Observe two volunteers for five trials each, using Volunteer Observation Form. Criterion: 90% appropriate delivery of cues, consequences, and data collection.
>
> Item: Observation of volunteer by teacher. Procedure: Choose 3 volunteers, check their observations from the previous week and count number of observations and whether criterion was met. Criterion: A volunteer who has met criterion should be observed at least once every two weeks. A Volunteer who has not met criterion should be observed once each two days he/she is in classroom.
>
> Item: Use of Volunteer Observation Form. Procedure: Arrange to observe teacher conducting a formal observation of a volunteer and collect agreement data. Criterion: 80% on cue, consequence, and data recording in each column.

This demonstration project was chosen as a severely handicapped outreach project and designed its evaluation plan to assess client satisfaction, performance of trainees during training, implementation of the model by the trainees in their home sites, and student change as a result of the implementation. Client satisfaction is measured through the administration of a checklist as shown in Table 4.

The object and evaluation plans for trainees while in training at the Teaching Research demonstration classroom are as shown in Table 5. To measure trainee performance at their own sites, an observation procedure consisting of 35 items is used (see above for example of those items as they pertain to volunteers). The complete list is presented in Fredericks, et al. (1979, pp. 190-200).

Finally, student performance data have been gathered on a probe basis both before and after training to determine whether improved student performance has resulted because of the training. Those data are reported in Fredericks, et al. (in press) and have been approved by the Joint Dissemination Review Panel.

SUMMARY

Few of the model programs for severely handicapped and deaf/blind children and youth present evaluation plans that meet the criteria delineated by the authors: that the project be able to identify the essential components and measure the effectiveness of each, and that during replication, four aspects of evaluation be included (consumer satisfaction; ability to acquire skills during training; implementation of the model in the consumer's own site; and child or client change data). As we examine the status of model projects, we would suggest that the U.S. Office of Special Education insist on a more stringent evaluation plan for its funded model projects. As part of the response to the initial RFP, projects should be able to prescribe not only the essential components of their models, but should also be able to describe a plan for training others in those components. This approach would allow OSE to analyze those plans and support only those that show promise of achieving model status.

There are several other aspects of program evaluation that should be encouraged. First, model projects serving similar populations should be compared to determine relative effectiveness in promoting student progress. Second, each of a model's various identified components should be subjected to research to determine whether it is a critical component. For instance, would the Teaching Research model achieve the same success if it did not have the parent component? Would it achieve the same success if it did not have the volunteer component? Those components have not been isolated for examination; yet these are valid research questions

Table 4
Form for Measuring Trainee Satisfaction

YOUR REACTIONS TO TRAINING AT THE TEACHING RESEARCH INFANT AND CHILD CENTER

My work was supervised mainly by ____________________(teacher's name)

Overall, my experience this week was ____ excellent ___ good __ fair ___ poor.

Instructions

1. Not applicable to me.	2. What I learned has doubtful utility in my setting.	3. Understood, but I knew this already.	4. I don't recall that this was presented.	5. Presented, but I didn't understand it.	6. Learned something I can use, but need more practice in its application.	7. Learned something I fully intend to use.	8. Intend to try to convince others of the merits of this.	
								A. Defining cues and behaviors
								B. Use of different types of reinforcers.
								C. Use of correction procedure in individual programming.
								D. Handling aggressive, self-indulgent, and non-compliant behaviors
								E. Pinpoint, baselining, and designing a behavior intervention program.
								F. Use of classroom model (teacher manager, activity
								G. Use of Teaching Research Curriculum in instruction.
								H. Collecting data while running a program.
								I. Using data collection system to make changes in instruction (updating and branching programs).
								J. Observation forms used to evaluate volunteers.
								K. Use of volunteers in instructional capacity.
								L. Delivery of cues and consequences when supervising groups of children

Please feel free to write any additional comments on back.

Table 5

OBJECTIVES FOR TRAINEES

TEACHING RESEARCH INFANT AND CHILD CENTER

OBJECTIVE	ACTIVITY	EVALUATION
1. Trainee will define 22 behavioral terms used at Teaching Research Infant and Child Center. Trainee will answer three questions concerning behavior problems.	1.1 Take a pre-post on the following terms: Baseline Behavior Behavioral Objectives Consequences Criterion Cue Positive Reinforcement Posttest Prescriptive Program Placement Test Primary Reinforcers Probe Punisher Reverse Chaining Self Reinforcement Shaping Social Reinforcement Time out Token Economy Aggressive Behavior Non-compliant Behavior Self-indulgent Behavior	1.1.1 Trainee will score 23 or 92% correct. If this score is met at pretest, the post-test is not required.
2. Trainee will answer 8 questions over Teaching Research reading materials.	2.1 8 questions over reading material.	2.1.1 Trainee will score 13 or 85% correct given as study questions during week.
3. Trainee will be able to conduct prescriptive programs in the areas of self-help, motor development and language.	3.1 Conduct prescriptive programs with a handicapped child in an individual instructional setting in the curricular areas of self-help, motor development and language.	3.1.1 Trainee will score 90% appropriate delivery of cues, consequences, and accuracy in recording data in any one curricular area on the Teaching Research Volunteer Observation Form.

Table 5
(continued)

OBJECTIVE	ACTIVITY	EVALUATION
4. Trainee will be able to modify or update existing prescriptive programs based on data collected during teaching session.	4.1 Participate in three updating sessions with staff.	
	4.2 Updating exercise: given 6 academic programs, complete with cover sheet, task analysis and data, update for next day.	4.1.1 & 4.2.1 Trainee will score 5 or 83% correct on the updating exercise.
5. Trainee will demonstrate the ability to administer a placement test utilizing the Teaching Research Infant and Child Center Curriculum and establish programs for a child.	5.1 Trainee will administer a placement test to a handicapped child in at least two curriculum areas.	5.1.1 Trainee will conduct a placement test completing 4 or 80% of items listed on TR placement test checklist correctly.
	5.2 Trainee will identify at least two programs appropriate for that child based on placement test data.	5.2.1 Trainee will correctly identify 2 or 100% of programs appropriately.
	5.3 Trainee will develop a clipboard for that child to include: cover sheet, consequence file, language file, program cover sheet, and data sheet.	5.3.1 Trainee will establish a clipboard to include 80% of the 27 indicated items, completed appropriately.
6. The trainee will pinpoint an inappropriate behavior exhibited by a handicapped child, gather baseline on that behavior, and design a program to alter the specified behavior.	6.1 Conduct existing behavior programs in a group setting.	6.1.1 Participation in the aide role as described in objective No. 6.
	6.2 Observe a group setting and pinpoint an inappropriate behavior in measurable terms and take baseline sample of the behavior.	6.2.1 & 6.3.1 Trainee will establish a behavior intervention program to include 8 or 80% of the necessary items, completed appropriately.
	6.3 Design a treatment to remediate the pinpointed behavior, to include a definition, terminal objective, method of measurement, baseline program, treatment program, and data system	

Table 5 (Continued)

OBJECTIVE	ACTIVITY	EVALUATION
7. The trainee will demonstrate the ability to manage groups of children engaged in free-time or seatwork activities.	7.1 Manage a group of children at the activity area.	7.1.1 Trainee will score 85% appropriate delivery of cues and consequences on the Teaching Research Aide Observation Form.
	7.2 Conduct one behavior intervention program and record data while managing a group of children.	7.2.1 Trainee will utilize specified treatment and appropriately record data as judged by trainer.
	7.3 Conduct a stimulation program while managing a group of children, presenting stimulus item and recording child response.	7.3.1 Trainee will score 80% appropriate presentation of the stimulus and recording of responses on the Teaching Research Stimulation Checklist.
8. The trainee will demonstrate the ability to utilize the Teaching Research Observation Forms.	8.1 Observe other trainees or staff in volunteer role.	8.1.1 Completion of 2 10-minute observations of volunteer performance with 85% agreement between the trainee and the trainer as to appropriate delivery of cues, consequences and data recording.
	8.2 Observe other trainees or staff in aide role.	8.2.1 Participation in group exposure session with aide Form.
9. The trainee will demonstrate the ability to manage the classroom in the role of the teacher.	9.1 Trainee will manage the classroom to include interacting with volunteers and staff, modeling programs, utilization of observation forms to evaluate volunteers and aide and general administration of class.	9.1.1 Trainee will when in the role of teacher, perform 5 of the described activities appropriately, as judged by the trainer, and complete 80% of items on the Teacher's Checklist on the Teaching Observation Form.

which should be systematically addressed so that OSE can serve as a broker, not only for program models but also for components of those models. Thus, this chapter is recommending not only that model programs should have stringent evaluation components to qualify as a model, but also, at a second order, that there be a research program that allows the comparative evaluation of different models and the isolation of critical components of individual models.

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TECHNOLOGY IN THE EDUCATION OF THE SEVERELY HANDICAPPED

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When one of the present writers was a graduate student at Ohio State University, one of the points of interest there was the "Pressey Museum" which contained some of the devices that Sidney Pressey had invented which could both teach and test (Pressey, 1926). The first device was simply an old typewriter roller attached to a box containing a cylinder with a sequence of metal leaves which, when pressed by one of four response keys, would turn the roller to the next question. By locating the leaves in the slot for the correct response in a multiple-choice question, the machine would rotate only when the correct response was made. However, all responses made by the student could be recorded on an attached mechanical counter, making it possible to establish a score for each "run" through the questions. By having the student repeat the set of questions until a run could be made without an error, the device could be used to teach as well as test. Pressey also invented an automatic scoring device that had a set of pins projecting through the correct answer holes in a standard multiple-choice answer sheet; by running a bank of mechanical counters over the sheet, the pins would activate the counters and provide a score in a matter of minutes. Pressey even devised a chemically treated answer sheet that would produce a green color for all correct answers and a red color for all incorrect answers. These devices were early examples of technology in education. However, Pressey was quick to point out that a patent had been taken out as early as 1886 for a machine that was programmed to teach spelling.

In the early 1960's, Skinner and his colleagues (Skinner, 1961; Holland and Skinner, 1961; Lindsley, 1960) were setting the stage for a revolution in education through the reintroduction of teaching machines and through the development of programmed instruction (Sidman and Stoddard, 1966). Skinner summarized this work in the Technology of Teaching (1968) and acknowledged the early work of Pressey. In his use of technology in education, Skinner based his efforts (as he had in his previous work on animal behavior) on two major principles. The first was that behavior is lawful and orderly. The second was that the conditions surrounding behavior must be controlled in order to see its structure and development. The emphasis was on the control of environmental conditions as the basis for providing an adequate analysis of learning, rather than on the control of the behavior itself. Teaching machines and programmed instruction provided the mechanisms of environmental control that allowed the opportunity to study the lawfulness in the relationship between teaching and learning. The principles continue to hold true today and are even more critical in the area of instruction of severely handicapped students than in their application to regular education.

The teaching machines initially used in regular education began with the rather simple devices that controlled the presentation of material in some systematic manner, required the student to make some type of response after each frame or item, and provided some means for allowing the student to determine the correctness of the response. One such device involved a plastic case which contained sponge rollers that were used to turn a succession of paper sheets up to a viewing area partially covered with plexiglas. The student would read the information in a given frame, write his response, turn the roller until the written answer was under the plexiglas so that the correct answer appeared, indicate the correct answer, and move on to the next frame. Subsequent machines were motorized with prepunched answer sheets that could accommodate four-part, multiple-choice questions, press-panel match-to-sample formats, and even programs in which each incorrect response led to a different item indicated by the type of error made by the student. These formats were predicated upon the abilities of the student to read, write, use numbers in a variety of ways, and select answers from among several that were provided as alternatives. Responses made by the student were evaluated and responded to by the machine in subsequent more sophisticated and computer-linked devices. Motivation depended upon "knowledge of results" in which formats were developed to note the pattern of correct responses. Many of the instructional programs utilized either linear (one item after another) or branching (different items depending on the type of error response made by the student) and were constructed to be as free from error as possible. However, the verbal requirements in almost all of these programs and the devices used to display the information tended to exclude the severely handicapped person from the body of students (largely regular education) with whom the devices were used. Consequently, a somewhat different history of technology emerged to accommodate the characteristics of the more severely handicapped student.

For example, Ferster and DeMeyer (1962) described a highly automated environment that was used in making an experimental analysis of the behavior of autistic children. The instruction received by the students in this investigation included complex discriminations and aspects of match-to-sample performances which were reinforced with coins that could be used to operate a variety of entertainment devices, including views of a pigeon and monkey that performed when their chambers were lighted. The analyses of stimulus discrimination and response differentiation made by Barrett and Lindsley (1962) had direct relevance for the education of the severely handicapped student even though the procedures were largely utilized with non-physically handicapped students in a research environment.

The bulk of available literature that was developed in research settings with severely handicapped students over the past 20 years is not generally available to the local school administrator who is now confronted with the mandate to provide an appropriate education for all children. Consequently, one purpose of this chapter is to review some of the more pertinent investigations to illustrate the methodology and problems encountered in using technology to educate severely handicapped students. A second purpose is to re-emphasize that technology is one method which potentially can be applied to provide low-cost, efficient, and effective educational opportunities. However, technology in and of itself is not the magic answer to the multitudinous problems involved in educating the more severely handicapped student. Many professionals in special and regular education are rapidly becoming aware that the proven formulas of classrooms, teachers, published curriculum materials, grouped instruction and curriculum, and standardized assessment procedures are in no way sufficient to meet the diverse educational needs of the more severely handicapped student in an appropriate and relevant manner. The problems involved in educating the severely handicapped were anticipated some years ago (Sontag, Burke, and York, 1973). However, the frustrations involved in attempting to meet the unique instructional needs of this population are only beginning to surface (Bricker and Campbell, 1980; Burton and Hirshoren, 1979a; 1979b). Instruction of certain types of students now labeled as severely handicapped has been of major concern to a number of researchers across the country for the past 20 years. This body of research literature cannot be ignored in analyzing the potential benefits (or non-benefits) of automating equipment as a means to better instruct the severely handicapped student.

A CASE STUDY IN THE USE OF TECHNOLOGY

The Bureau of Education for the Handicapped (now the U.S. Office of Special Education) issued a request for proposal to contract for a system of telecommunications for severely handicapped children and youth in 1974 (RFP-74-5). The request was based in part on a meeting sponsored by the Bureau in 1972 to discuss problems associated with education of severely handicapped students. A successful bid was made by the University of Kentucky and was followed by a two-year experimental effort that included many aspects of technology (Tawney, 1977).

> ...This project was initiated to develop a prototype transmission system to link a computer to home placed learning devices via a telephone transmission system. We proposed that individually designed teaching machines, placed in homes and controlled by the computer, might be a reasonable and relatively inexpensive way to reach children who were geographically or politically removed from educational opportunities. (Tawney, 1977, p. v)

The system consisted of a minicomputer with 12,000 words of core memory, an associated "bank" of electronic logic cards, data collection devices, and 6 remote stations with telephone communications linkages and 3 basic educational devices to be used with the students. The essential strategy was to make phone contact with the home, have the parents place the child in a position to interact with the given instructional device, and to then link the responses of the child with the computer, with feedback provided on the quality of the child's responses. During the two-hour hook-up each day, the child was to be shifted among the three instructional devices to interact with each for a period of time. In this way, a given child could be provided with precise instruction for two hours per day without the necessity of a skilled teacher in the home. Six such linkages were possible each day so that six different children in a widely distributed geographical area could be served from the central station. Given the fact that the average teacher of home-bound children spends approximately 40 percent of the professional day traveling, an equivalent coverage of these children by a teacher would require about 2.5 full-time personnel. This would require about $40,000 per year for salary, fringe benefits, and travel expenses or about $65,000 per pupil. Tawney estimated the telecommunications costs to be about $2,848 per year per pupil (1977, p. 109). Such savings would be impressive if everything else were equal. Unfortunately, this was not to be the case.

Tawney devised five basic tasks that could be used with handicapped young children in their homes. The first was a double-ring arm-pulling apparatus which a young child in a supine position could reach and then pull with a required pressure in order to strengthen the arms, chest, and shoulders. When the child met the pressure requirement, a tape recorder was activated to provide a form of reinforcing consequence of unspecified content. In the final report, Tawney presents the data for ten students who used the arm-pulling apparatus. The best results were obtained from a 24-month-old Down's Syndrome child (identified as I-6-W) who went from an average of 22 pulls per session under fixed reinforcement of one reinforcement per pull to 48 pulls per session under a fixed ratio schedule of two responses per reinforcement. However, the performance was quite variable across sessions, showing a standard deviation in performance of 14 pulls per session under the FR 1 condition to one of 22 pulls per session under the FR 2 condition. Thus, changes of 30 or more pulls from one session to the next were not uncommon. In addition, the subject's highest sustained rate occurred between the 35th and 40th sessions out of a total of 52 sessions. A second good example was shown by a 42-month-old child who was diagnosed as brain damaged (identified as student I-13-P). Under the FR 1 condition, this student pulled the ring at an average of about 30 pulls per session and averaged 60 pulls per session under the FR 2 condition. However, during the first half of the FR 2 condition, this student averaged about 68 pulls per session with a standard deviation in performance of approximately 17.42 pulls. In the second half of the FR 2 sessions (14 sessions), only 52 pulls per session with a standard deviation of 21.86 pulls were generated. From an overall perspective, each of these students was moving toward extinction under existing conditions of reinforcement provided by the automated apparatus. This effect can be seen most dramatically with a 30-month-old child who was diagnosed as microcephalic (identified as student II-8-U). This student went from an average of 54 pull responses in the first 32 sessions of an FR 1 schedule to about 41 pulls per session in the 25 sessions under the FR 2 condition. Thus, she dropped her average by more than 13 pulls per session even though she would be expected to practically double her rate under the FR 2 ratio schedule. In addition, six of the last seven sessions used with this student indicated response rates of under 30 pulls per session. The remaining seven children for whom data are included in the final project report failed to show significant improvement across sessions or demonstrated more emphatic extinction efforts. Clearly, the programmed consequences for pulling the ring were generally not sufficiently reinforcing to develop or sustain this response form across sessions.

An arm-pulling response, requiring a very simple motor form which is in the response repertoires of most young children, has typically been used by researchers. However, the relevance of instructing a child to pull with his arms from a back-lying position is questionable from many perspectives and illustrates the initial difficulty in effectively utilizing automated equipment to instruct severely handicapped students. The purpose of any automated device is to assist the student to learn or acquire a form of behavior that is required whether or not equipment is available to teach that response form. The presence of automated devices cannot overtake the function of education to the extent that only those forms of behavior that are possible to teach through equipment become part of the student's individualized curriculum. There is no way of knowing whether each of the students for whom data is reported in the telecommunications project received arm pulling because the arm-pulling device was one of four possible apparatuses designed for the project or because each of these students required intervention to learn arm pulling (or to strengthen the arms). A second and perhaps more essential problem, however, is also revealed by these data and relates to the problem of motivation in the education of the severely handicapped. No one student is likely to acquire forms of behavior without the delivery of consequences that are individualized to the motivational conditions of that student. Delivery of the same consequences (in this case, a tape recording) across students without further individualization is not likely to produce increased rates of behavior and will be effective only with those students whose behavior rates increase as a function of receiving consequences that can be delivered through a tape recorder. Many of the students who are classified as severely or profoundly handicapped demonstrate a number of deficits in primary sensory systems, such as vision and hearing, as well as in the basic motor response system. Use of any automated instructional equipment must be within a frame of reference that allows for the delivery of consequences individually tailored to the student's primary deficits, as well as to the motivational requirements. The diversity of the problems associated with severe handicaps would generally indicate that situations where identical consequences can be universally provided across students are few.

The second device used by Tawney consisted of a kick-panel which could be moved with a required degree of force by a young child placed in the supine position. When the child kicked the panel, a tape recorder would play for a brief duration. Only one data chart is contained in the final report for this activity. The student was an 18-month-old infant who had been diagnosed as brain damaged (identified as student III-2-D). Approximately 27 sessions were used in this activity with the student. In the first 13 sessions, the panel was kicked an average of 54 times with a standard deviation of 26.19. However, during the last 14 sessions, the panel was kicked an average of only 26 times per session with a standard deviation of 18.57. This record would also signal extinction resulting from a weak reinforcer repeated over too long a period of time.

The third device was a three-choice response panel with which the student was taught to press the one panel among the three that was illuminated in what was called a visual tracking task. Data are reported for only one of the students: an 18-month-old youngster who had been diagnosed as being microcephalic (identified as student II-46-af). The record of responses was taken over a period of 23 sessions which depicted a range from 14 to 24 responses per session and a standard deviation of 3.8 responses. Data are represented as total correct responses and no indication is given as to the extent to which the responding is under the control of the illumination itself. In other words, if the student had generated about 60 responses per session and 20 of them were correct because they coincided with an illuminated panel, a judgment could be made that the child was responding at a level that would be expected by chance. In any case, there is not improvement across time for this student.

Two procedures were used with the final device, which was a match-to-sample format in which the student was required to press one of two panels that matched an upper panel in brightness or on letters. The eyes of a painted clown face mounted above the press panels illuminated when the student correctly matched to sample. Six out of six students represented in the final report showed improvement in matching to brightness across sessions. These students ranged in age from 42 to 84 months. Data on letter match-to-sample is presented for five students with the same age range as those reported in the brightness match. Two of the five demonstrated learning in this letter-matching task but, in both of these cases, performances were quite variable throughout the sessions reported.

Overall, 53 students were referred to the telecommunications project as potential participants. Twenty-two of this group were rejected without subsequent interview because they were clearly outside of the program criteria for inclusion -- primarily because of exceeding age requirements. The remaining 31 students were interviewed and 13 of the interviewed families were not accepted into the program because the child was over the age limit, could not respond to available reinforcing consequences, was not handicapped to the required degree, or because family members chose not to participate after the project was described to them. The data described in the above paragraphs were taken from the remaining 18 students, although no indication is given as to how many of these were included in each of the five procedures. The records do indicate that the remote terminals were placed in the homes of the 18 participants for periods that ranged from 26 to 205 days. The devices and the remote units were available to the students for a total of 2249 days but, for a variety of reasons, the number of instructional lessons that provided data amounted to approximately 1045 days or less than 50 percent of the system's capacity. About 25 percent of the instructional time was lost due to failure in apparatus -- a third major difficulty in effective utilization of technology in educating severely handicapped students. However, of greater importance is the fact that only three out of ten students showed improvement in the ring-pull task, no one showed improvement in the kick-panel or visual tracking tasks, and only two out of five reported students improved on the letter match-to-sample task. Only in the brightness match-to-sample task did all students included (six) demonstrate improved performances across time.

A decision as to whether or not to automate instructional equipment in educating severely handicapped students that was based solely on a review of data from this telecommunications project would certainly be negative on the basis of the poor instructional results obtained with this group of students. However, the project demonstrates a number of relevant uses of technology when content and motivational issues are separated from those directly related to technology. Instructional materials can be programmed and presented to a student in a systematic manner without the direct intervention of a professional. The match-to-sample tasks in which the student was started in the brightness task and shifted to discriminations and matches that are based on letter configurations is a clear extension of procedures used successfully by Sidman and Stoddard (1967) with the added touch of Touchette's procedure (1968) for detecting the point of transfer from one stimulus condition (brightness) to another that is more complex (letter configurations). Therefore, instructional methods and procedures developed largely by individuals conducting learning research can be incorporated into the daily instruction received by severely handicapped students in classroom environments, forcing a bridge between research and education. A third fact is that the behavior of a student can be measured automatically in a manner that translates qualitative aspects of performance into quantitative indices and does so in an objective system. All of the measures used by Tawney contained the important ingredients of operational definitions, in that successful manipulations of the apparatus triggered a switch which translated qualitative movements into quantitative units. Such direct measures of performance are considered by many to be essential to the successful education of the severely handicapped (White and Haring, 1976). Finally, the consequences of a successful performance can be automatically programmed, as Tawney and his colleagues did in providing the vibrator, the musical segment, and the lighted clown's eyes. However, there are obvious limitations in the use of such automated procedures when one considers the broader context of educational curriculum for the severely handicapped.

An additional issue frequently cited in discussions on the use of automated equipment in instructing severely handicapped students is that of costs. The telecommunications project's projected costs certainly compare favorably with home instruction provided by a trained educator. However, actual costs per pupil or per instructional unit are not included. Even with considerably higher costs per pupil than projected by the telecommunications project, the education of those participating students would be less costly than providing home instruction (or perhaps in some locations than providing residential services or long-distance transportation). To this extent, the cost issues in the use of technology to educate severely handicapped pupils must be kept separate from the content/ instructional issues. A total educational program for a severely handicapped student which included only arm pulling, leg kicking, visual tracking, and match-to-sample (or selected aspects of this "total program") would be questioned in terms of relevance and instructional content, regardless of whether the programs were provided by automated equipment or a trained teacher or occurred in the home or in a school. More important is the fact that computer costs have decreased considerably since 1974 when the telecommunications project was initiated. More sophisticated, less costly, more adaptable, and more easily operated equipment is constantly becoming available. Therefore, any appraisal of costs involved in utilizing equipment and automated devices to educate severely handicapped students must be made in relation to an estimate or projection of a constantly changing technology. As the computer science field offers more sophisticated, less costly equipment, the educator will be able to use technology to assist in educational programming which is cost-efficient. However, only to the extent that relevant educational instruction can be automated through equipment will the use of technology be beneficial to the severely handicapped student.

AUTOMATING THE EDUCATIONAL CURRICULUM

An average consumer who has watched the "Six Million Dollar Man" on television or who has experienced the remarkable technological achievements that occurred to place people on the moon cannot help but believe that our technological capabilities for dealing with the problems of handicapped students are unlimited. LeBlanc (1978) lists some of the problems involved in the use of technology, including low volume because of the small number of potential consumers, insurance liability problems, problems associated with marketing and maintenance of specialized equipment, difficulties in matching the capabilities of devices to the wide-ranging motor and cognitive difficulties presented by the target group of consumers, and the current and rapidly changing structure in the electronics and product development fields. As LeBlanc says: "All the new shiny products of research are not worth a wooden nickel unless they reach and are found to be useful by the people who need them" or the problem in reverse--"Consumer Charley buys a brand new Whosit Mark II and finds out one week later about a Whamie I which does a better job and costs less!" (1978, p. 4). Somewhere between the complete disregard of technology in the education of the severely handicapped student and the overly optimistic belief that technology solves all of our problems with this population lies a use of equipment and programming capability that is efficient, cost-effective, and educationally or personally beneficial to the handicapped person.

A second project reviewed for this article was also under the direction of Tawney (Tawney, 1979; Tawney, Knapp, O'Reilly, and Pratt, 1979). This project, the Programmed Environments Curriculum, involved no automated instruction at all. In essence, the validation report and the published curriculum itself provide relatively specific instruction for providing education of severely handicapped students in approximately 80 content domains. The areas of instruction are those that are more familiar to educators and include self-help skills, gross and fine motor training, cognitive skills, and receptive/ expressive language. However, none of the 80 units of instruction include ring pulls, kicking, matching illumination, tracking the lighted panel, or matching letters. Only six units out of the 80 included in the curriculum could be automated in a way that would make the presence of an adult or trained teacher unnecessary. Identifying objects, people, finding hidden objects, finding a source of sound, matching common objects, and stimulating head stability in the upright position could be automated, although some automations would be fairly difficult within a telecommunications system. Hidden objects could be projected and then withdrawn in an illuminated panel device with the student signaling the immediate past location of the event by pressing the relevant panel. Methods for automating head control have been discussed in previous reports (Campbell, Bricker, and Upp, in preparation; Wooldridge and Russell, 1975). However, Tawney and his colleagues did not automate any aspects of the Programmed Environments Curriculum.

This issue is critical to the issue of utilization of equipment and automated devices to educate severely handicapped students. First, many curricular skills do not lend themselves to automation. Second, automated equipment is a method of instruction but should not be the content of any child's educational program. Severely handicapped students provide a diverse and often highly individualized set of characteristics which are difficult to group accurately for reporting group effects of any instructional approach. The content of any child's program must be individually validated and judged as relevant before any automation can be utilized. In analyzing the Programmed Environments Curriculum (or any other of the many curricula available for the population of students labeled severely handicapped), an obvious conclusion is that there is no point in automating instructional content that does not benefit the students nor instructional task analyses that are not represented in a way that the student is able to acquire the skills through standard practice intervention.

REINVENTING A SQUARE WHEEL

Educators responding to the instructional pressures provided by severely handicapped students in public school settings may inadvertently revise techniques or procedures that were discarded earlier by researchers in the field of handicapped children. A clear example of this is provided by Zuromski and his colleagues with support from the Bureau of Education for the Handicapped First Chance Network. An early report of their work presented at a meeting of the American Psychological Association described the use of an electromechanical response device (Zuromski, Smith, and Brown, 1977). A second presentation on a simple discrimination learning apparatus was presented at the Eastern Psychological Association meeting in 1978 (Accrino and Zuromski, 1978). These presentations were supplemented by a series of technical reports indicating how to build simple devices (Accrino, undated) and wire them (Tashjian, undated) as inexpensive contingency devices. At first glance, the devices and their use appear to provide an inexpensive means of helping a severely handicapped student to interact with his environment. A closer analysis reveals some of the problems involved.

A major problem with any equipment is that it has a relatively fixed response requirement and only a limited number of consequences that can be used as potential reinforcers. Consequently, the type of learning involved is simply an increase in an already existing form of behavior. This is of small educational relevance. What Zuromski states is that:

> ...The active stimulation concept has particular relevance to the institutionalized children who typically have little control over events of their day. They may be fed, dressed, washed, spoken about but not to, and left to themselves for the most part.
>
> ...Active stimulation programs may very well provide the right tools for institutionalized children to learn to control their environment or to reestablish control, and thus develop and maintain a greater awareness of themselves in relation to their immediate environment. (Zuromski, 1977, p. 2)

Taken in this light, the equipment is supposed to replace human contact (or the lack of it) instead of using the devices to teach any progressive sequence of skills. This is exactly the form of devaluing that is seen in so many aspects of educational and therapeutic programming for the severely handicapped. The reverse structure would use the people to teach the severely handicapped to use those forms of technology that are available to all children. For example, arm movement that turns on human voices could be derived from a self-feeding program in which appropriate approximations to bring food on a spoon to the mouth would result in food and social praise. Actual rather than contrived television controls could be used to give the severely handicapped control over that form of entertainment and other buttons used to change slide-projectors or to hear stories on tape recorders. However, the selection of such entertainment must also be under the control of the child, instead of using procedures, as Zuromski has, of simply wiring the child to produce whatever the trainer has available to turn on or off with the inexpensive switches. Again, as before, the same principles of applying automated instructional devices with severely handicapped students in an effective way prevail. The equipment cannot be the instructional content in and of itself. Rather, technology must supplement or provide the method of instruction. Secondly, "poor" content is not made "better" through automation, nor is ineffective instructional methodology improved by automating the ineffective procedures. Zuromski and his colleagues have certainly shared their equipment designs and inexpensive devices. However, without more specific application guidelines and procedures, and applying technology as has been done in their

First Chance Network Project, not only has the wheel been reinvented (or perhaps less well applied to a new population of recipients), but the reinvention is square relative to the overall educational and programming needs of severely handicapped students.

USES OF TECHNOLOGY

Beginning in the mid 1960's and stimulated by the work of a number of researchers in the area of applied behavior analysis (Bijou and Orlando, 1961; King, Armitage, and Tilton, 1960; Ferster and DeMeyer, 1962; Sidman and Stoddard, 1966) and the sudden availability of research money derived from P.L. 88-164 for research in mental retardation, there was a rush for the purchase of automated equipment for *research* purposes. Stimulus-presenting devices, electromechanical and solid state logic systems, and a wide variety of automatic reinforcement devices including one that was specifically adapted for the delivery of M&M candies became the basic tools of both research and education (to the extent that education existed for severely handicapped students in the 1960's) with the handicapped population. Some automation was relatively simple, such as in the use of mercury switches for postural control or in the use of a moisture-detecting circuit for signaling voiding (Watson, 1968). Others were quite complex, such as the Peabody Automated Multi-Dimensional Discrimination Apparatus or PAMDA (Bricker, Heal, Bricker, Hayes and Larsen, 1969), which could be used to detect and correct a variety of error patterns in the discrimination learning of severely handicapped young children. This apparatus, in addition to one designed and used to assess auditory functions of severely handicapped students (Bricker and Bricker, 1969), can be used to demonstrate some of the major applications and problems with complex devices.

One purpose of automation is to accommodate the slow learning process and precise teaching requirements of the more severely handicapped learner which often test both the patience and the competence of the classroom teacher. An appropriate device has unlimited patience and all of the precision that can be programmed into the computer-like decision-making apparatus. In the PAMDA, there was an automated basis for determining whether a student was selecting a single position and if so, to keep the reinforced item on the other side (alternate position) until the student made a selection on the other side. The device could "read" single and double alternation response tendencies of the student and counter these automatically in order to shift the object selection to the object itself, rather than rely on a pattern of shifting position tendencies. The PAMDA was wired to provide a buzzer for all incorrect responses in association with a variable duration time-out procedure. A set of chimes provided a consequence for a correct response which was correlated with the immediate delivery of a piece of candy, a trinket, coins, tokens, or even a small amount of fluid delivered automatically through a dispenser located beside the student. The device took months to design and build and then had to be monitored by a full-time research assistant in order to determine that there were no malfunctions in the training sessions. The same full-time assistant could have performed most if not all of the same functions that the device did without the months of delay that frequently occurred because of equipment malfunction. In addition, even with a greater number of potentially reinforcing consequences used in the PAMDA than those used with either Tawney's or Zuromski's devices, the problem of sustaining motivation across sessions still existed for a large number of the severely handicapped students who received training with this device. Finally, no severely physically handicapped students were included in the group of children who used the PAMDA, because few would have been able to interact with the machine.

Simultaneous with the utilization of equipment by researchers to assess and train basic learning skills, such as discrimination and match-to-sample, has been utilization of technology by biomedical engineering researchers to training selected aspects of movement, hearing, and vision. A number of these researchers have been involved in various experiments with physically handicapped individuals, most of which have utilized equipment to teach relaxation, train contractions of specific muscles, develop control of unwanted or uncoordinated movements, or teach specific and fairly simple motor behavior such as head control, arm position, or foot elevation and other components of gait training (Basmajian, 1969, 1975; Connolly, 1968; Harris, Spellman, and Hymer, 1976; Herman, 1970; 1974). The majority of these researchers have basically employed operant procedures using electromyographic readings in combination with auditory and/or visual feedback to train physically handicapped people to control various aspects of movement by conscious control. These experiments and their results have typically not been practiced outside of sophisticated research centers and have not been incorporated into basic therapeutic practices with physically handicapped individuals. Biofeedback training of these types allows individuals to attend to aspects of their own behavior that would normally not be detectable by the individual. A spastic individual can be made aware of degree of muscle tension when the electrical activity accompanying changes in muscle tension is visually represented though the EMG recording. Conscious control of the muscle tension can be attempted by the individual through direct view of the EMG recordings or through establishing pre-set levels or thresholds below which the muscle tension must be consciously brought under cortical control. Devices such as lights or sounds can be used to both "warn" the individual that muscle tension is increasing or to establish the threshold below which the individual must bring muscle tension by "turning off the sound" or "turning off the light." Combinations of both positive and negative feedback have also been used so that the individual receives one form of feedback (for instance, a buzzer) for incorrect responses and another form of feedback (for instance, a light) for correct responses. Although the task or activity being trained (lowering muscle tension) differs somewhat from more traditional forms of learning (such as discrimination training), the procedures utilized are quite similar and the devices, although technologically different, are fundamentally established in accordance with the same experimental principles used with the previously described PAMDA discrimination learning apparatus.

Observing and accurately interpreting EMG readings would be an exceedingly difficult discrimination for normal young children as well as for severely handicapped students. In fact, the relationships between extinguishing or turning on a light and degree of muscle tension would be a very complicated task for an individual who had not yet acquired basic concepts of cause and effect and other sensorimotor relationships. However, providing the degree and type of feedback which would be within the motivational interests of the young or severely handicapped child extends basic biofeedback methodology to the point where motor control can be trained in individuals who lack complicated discrimination and cause-and-effect relationships. Such an approach has been used by researchers under the title of augmented sensory feedback training, using the superimposed toys and other items of interest; for example, a child is trained to turn on an electric train that will activate only under conditions of decreased muscle tension (Herman, 1974) or to hold his head in position in order to hear music or the radio (Wooldridge and Russell, 1976) or to bear weight on his legs for increasing amounts of time in order to have a toy car progress around a race track (Rugel, Mattingly, Eichinger, and May, 1971). Each of these experimental investigations demonstrated increases in the behavior being targeted under initial conditions of additional sensory feedback (or reinforcement), and each required automated devices in order to activate the feedback and to measure the responses of the student over time.

These experiments differ little from the previously mentioned automated learning experimental investigations other than along dimensions of instructional content and the specific types of automated equipment required. In fact, much of the experimentation with young cerebral palsied students or with the more severely handicapped population under the title of augmented sensory feedback, although a downward extension of biofeedback, differs little from some of the experimental paradigms used in research with extremely young infants (Butterfield and Sipperstein, 1975; Morse, 1974) or, in particular, to develop contingency awareness in young infants (Watson, 1966). However, the equipment required to measure specific muscular activity through use of EMG recordings is somewhat complicated, requires extensive training to operate accurately, is dependent on type (needle or surface electrode), and may not be legally usable by anyone but a trained physician or technician. These factors have precluded the utilization of biofeedback motor training on any wide basis within either the public school or clinical therapy setting and have largely restricted the sophisticated measurement and training that is possible through these procedures to the research setting.

Despite the difficulties in implementing motor control or skill training through automated means, a few investigations and/or applications of available equipment have been made in educational settings (Campbell, Bricker, and Upp, in preparation; Inman, 1979) with the more severely handicapped student. In general, several basic principles have emerged which are not too different from earlier attempts to apply technology in the education and training of severely handicapped students. These principles are worth repeating, particularly in light of educational administrators' and teachers' needs to find something that will make the education and training of this population easier and more cost efficient. The first of these is that automated equipment will not be of value unless it assists in teaching a skill that is judged as relevant by other standards of curriculum evaluation. A leg-kicking instructional target or one that develops head control or increases arm pulls or switch closures on a given interface is not a meaningful instructional target for a severely handicapped student if acquisition of that skill does not systemically lead to acquisition of more and more complex forms of behavior. In other words, if the student learns to raise his head to see what is going on in his environment and is then able to maintain that degree of head control under normal environmental conditions and across various other tasks, the initial skill of increased head control is relevant and beneficial to later skill acquisitions and environmental interactions. However, it would be difficult to generalize increased leg movements to walking or to any form of functional mobility, and increased kicking does nothing in and of itself to make the severely handicapped student more functional in his environment. Similiarly, being able to pull a switch or press a panel or activate some other form of interface is not valuable to the severely handicapped student unless that increased form of behavior can be chained into a more functional response. To this end, teaching a severely motorically impaired student to activate a joy stick interface to receive consequences of music or visual stimulation or any other form of sensory feedback may be valuable if acquisition of that skill will transfer to learning how to manipulate an electric wheelchair through use of the same joy stick interface.

The second principle involves the consequences delivered to the handicapped student as a function of the automated equipment. The consequences provided by any automated equipment as part of any relevant instructional task must be individualized to the child and must be of the type that will produce an increase in the desired form of behavior. In our general experimentations with use of automated equipment for training very severely multihandicapped students, we have found that often a meaningful consequence cannot be identified and therefore behavior is not under the control of consequence events. (Campbell, Bricker, and Upp, in press; Campbell, Esposito, Simmons, and Middleton, 1980). Music will not be highly motivating for a student with hearing impairment nor will a visual display of any nature increase the performance of a blind student. A student who dislikes M&M candies or other forms of food will not readily learn to activate a lever in the presence of sound to obtain the M&M. Although these examples appear rather dramatic, the difficulties in identifying relevant and motivating consequences, particularly for institutionalized students or young students who have learned to be helpless (Seligman, 1975), are a generalized problem in the education of the more severely multi-handicapped student (Bricker and Campbell, 1980; White, 1980). The point here is to reinforce that equipment designed to train a student to perform a given task through automated means can be beneficial only in the presence of a known group of events that are motivating or meaningful to that student.

A second issue related to consequence conditions is one of satiation or extinction. In attempts to train head control with nine multiply handicapped students, increasing behavior was often extinguished through over-use of often minimally interesting consequence conditions. Only very well trained staff were sensitive to the emerging extinction curve sufficiently in advance to alter the consequence conditions rapidly enough to prevent over-use of a given reinforcer. This type of situation is evident in the earlier reports of the telecommunications project (Tawney, 1977) and is evident in the limited data reported by Zuromski and his colleagues (Zuromski, 1978). Perhaps a more positive way to state the problems regarding motivational conditions and automated technological training is to say that technological devices can be effective only with severely handicapped students who respond (increase behavior) to those types of consequences which can be sufficiently automated to be delivered by the apparatus being used in training. An extremely creative programmer may be able to design individualized consequences for a student with both hearing and visual and motor impairment, but the precision required may be easier to deliver through human contact rather than interaction with an instructional device.

The third issue in the use of automated training devices with severely handicapped people centers on the generalization of behavior which is under the control of fixed and contrived consequences across more functional settings and individuals. This issue has not been well addressed in any of the literature on use of instructional technology but is one that deserves particular consideration with severely handicapped people who are typically known to have difficulty automatically generalizing a learned skill to a wide range of environments. Our limited experiments with head control training indicate that the increased head movements which occur under the control of a specific consequence (like music or visual display) do not automatically increase in the more normal and less contrived environmental situations where specific consequences are not delivered for increased head movements. Our initial interpretation of this occurrence is that the lack of any generalization seems to occur most often with students whose behavior remains strictly under the control of the consequences or at a primary circular rather than a secondary circular or contingency awareness level where behavior would shift to come under the control of stimulus conditions. Piaget (1952) has described primary circular reactions as behavior characterized by increased responses in order to produce interesting consequences. However, each cycle of behavior is independent of any other and is under the control of the interesting consequences that are produced at that moment in time so that, according to Piaget, the relationship between movement and consequences is discovered each time without relying on previous encounters with the same novel consequences. Therefore, the initial step often used (and frequently the only step) in training severely handicapped students on any given task with automated equipment should be attainable with any student, assuming that the consequences are, in fact, novel and interesting to the child and that the required behavior is within the repertoire of the student. An increase in the rate of any required response (leg kicking, arm pulling, switch activation, head position, reduced muscle tension) should be possible to the extent that the consequences are motivating. However, without known motivating consequences, there is no theoretical reason why the behavior of the student should change (with or without the use of automated instructional devices).

The problem then becomes one of designing experiments that shift the behavior of the student to the control of a stimulus condition. Tawney (1977) did not reach this level with any of the students reported in the final report of the telecommunications project and, in fact, the increased responses initially obtained began to become extinguished before alterations were made to any great extent in fading the consequences. Similiarly, Inman (personal communication) has reported difficulties in maintaining improved performance of cerebral palsied adults across time even when those adults should have been able to internalize the stimulus of an internal "feeling" of less muscle tension or were able to revisualize a "mental picture" of turning off a light stimulus. The important point here is that the function of education for severely handicapped students is to instruct these students to perform behaviorial skills that will enable them to become more functional as adults. Increased head control or any other behavior that does not ultimately lead to independent skill performance within an environment that does not include automated equipment is of little value in the long run to the severely handicapped person. The positive aspects of automated training devices frequently diminish when the equipment becomes just one more aspect of the task training which will have to be faded in order that the student may demonstrate the skill in a true functional sense.

THE FUTURE OF TECHNOLOGY

There remain many forms of technology that have appropriate use in training severely handicapped students. A head-position device that uses a mercury switch is a good means for signaling the teacher (and the student) that the head is in the proper (precise) position for the student to be given access to a spoon by the teacher for self-feeding. In fact, the value of such devices may be more related to informing the teacher or trainer than to specifically training the student. Automated communication devices (Vanderheiden and Grilley, 1975) can be devised for using such dramatic technical factors as eye-pointing or head position or head position changes to activate scanners or printers or other forms of computerized technology. Electronic musical instruments and magnet-based sketching boards give immediate feedback without being isolated from their normal purpose and use. However, in the vast majority of cases, these uses of technology should be known and used by professionals and parents working with the severely handicapped person. They are not "special" tools but are some of the tools that should be used by all people who are involved in establishing and delivering programs for severely handicapped students.

We have attempted to limit this chapter to a report of technological and automated devices in relation to training the severely handicapped student to perform a defined skill. However, there are other, more common uses of technology both with severely handicapped students as well as in education in general. These forms of technology are known, available, and marketed by a variety of agencies (such as the National Aeronautics and Space Administration) and companies. Available forms of technology include electric mobility devices, communications devices, specialized switching units that allow control of environmental conditions (such as changing a thermostat or turning on a television or stove), and protection and instructional devices that operate through microswitches and radio transmission. Various forms of computer-assisted instructional devices and teaching machines (although perhaps not appropriately programmed for content for severely handicapped students) have also had wide use in general education. However, while individuals working with severely handicapped students are designing elaborate training apparatuses to teach the student a specific skill, there are thousands of physically involved students without appropriate wheelchairs. Hundreds of cerebral palsied students who could talk (without training), simply with the addition of a communication device, go without this known form of technology that would enable these students to possess immediate abilities to interact with the individuals in their environments and to participate in more normal forms of education. While the immobility of many physically handicapped students is used as a reason for lack of inclusion in more normalized environments, these same students go without the simple technological devices that would provide instant mobility in at least selected aspects of their physical environments. The costs of such devices are frequently used as a reason for lack of purchase, but lack of information about availability, application, and use of appropriate technological aids is more often the deterrent. Our current national stance in relation to technology is that utilization is costly and non-beneficial over the long term. Educators and therapists frequently have limited knowledge of the forms of technology that have been developed in research, engineering, and specialized centers and are available nation-wide. Parents and school administrators, as well as other professionals, lack the financial resources or information to secure appropriate technological aids for the severely handicapped students who could benefit from the more simple forms of technology. The point here is that the field of severely handicapped education may not need more technology than is already developed, and a focus on obtaining those devices that will at least produce mobility and communication for physically handicapped students should be basic to every educational program. To ensure that every student who could benefit from specialized adaptive and communication equipment receives that equipment would be an important step forward in applying technology to generalized education of severely handicapped students.

Utilization of technological devices to train students to perform specific skills must retain a strategy of first using highly trained and interdisciplinary professionals in clearly specified demonstration activities to show how and what special activities can be used to develop and sustain age-appropriate forms of behavior that meet the criteria of ultimate function. Neither machines nor other, less specific forms of instruction should be substituted in this process until relevant curricular content for severely multihandicapped students has been better defined and specified. Machines should be used in this effort only when their function clearly adds to the efforts of training personnel. To date, the evidence is fairly clear that even our best professional efforts with multihandicapped students produce only mixed benefits (Bricker and Campbell, 1980). The old adage pertains -- a computer is only as effective as the individual who designs the program and tells the computer what to do. We cannot expect technology to accomplish what professionals have been unable to produce -- relevant curricular content for multihandicapped students, effective training strategies, and improved behavior that will enable the severely handicapped student to function meaningfully as an adult.

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SERVICE DELIVERY: THE QUESTION OF CATEGORIES

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School districts across the country have typically provided educational programs for handicapped children in isolated settings on the basis of categorical educational formulas. Universities and colleges have developed teacher training programs in response to the demands of public school systems, again following a categorical approach to defining exceptional children. This chapter will attempt to assess the relationship between categories of exceptional children, the educational programs derived from these categories, and the teacher certification requirements used to meet these programming needs. More specifically, we will address the educational validity of identifying even more specific categorical designations within a severely handicapped population, and discuss possible alternatives to this approach.

In accomplishing this task, the chapter will include a brief historical review of special education in this country (portions of which are paraphrased from the excellent review by Reynolds and Birch, 1977), a discussion of current classification assumptions and practices, the role of the U.S. Office of Special Education (formerly BEH) in extending subcategories within the larger severely handicapped category during the past decade, and alternative approaches to a categorical service delivery model for severely handicapped individuals.

DEVELOPMENT OF SPECIAL EDUCATION IN THE UNITED STATES

The first organized educational program for exceptional children (The American Asylum for the Education and Instruction of the Deaf) was established in 1817, in Hartford, Connecticut. In 1829, the first residential school for the blind was established in Watertown, Massachusetts, followed in 1859, by the first residential school for persons with mental retardation (Massachusetts School Idiotic and Feeble Minded Youth) in South Boston, Massachusetts.

These first organized arrangements for the education of the handicapped were patterned after the residential schools of Europe that tended to be narrowly categorical in nature. Each residential school prepared teachers for specialized work within the specific residential setting through on-the-job training programs. Teacher roles were necessarily defined categorically, as a function of the system. These early residential programs set the dominant pattern of special education that was to develop in the United States over the next several decades to the present times.

During the early 20th century, special classes and public day schools were established on a limited basis. The emerging day school programs were dependent upon the previously established residential schools for guidance, curricula, and teacher preparation. Vineland Training School in New Jersey, for example, began summer training programs for teachers of the mentally retarded in 1904. These early programs (which provided minimal services at best for a limited number of handicapped children) were modeled after those developed in the residential schools. On the basis of existing practices, it was assumed that exceptional children should be educated by special teachers in special settings.

In the 1920's and 30's, formal teacher preparation programs were begun at such universities as Wayne State Teachers College of Columbia and Eastern Michigan at Ypsilanti. These teacher training programs were also modeled after those developed in the residential schools.

Special education programs developed slowly until after World War II when societal changes began to emerge within the United States. Social influences, including the civil rights movement, prompted the organization of special interest groups such as the National Association for Retarded Children (1950) and other parent and child advocacy groups. These groups provided the impetus for civil court action and the passage of legislation that set the stage for the expansion and improvement of special education programs. Large-scale public school programs and teacher training programs at major universities were organized in response to this increasing public pressure. The number of categories of exceptional children also increased to accommodate children who did not fit into the existing categorical designations (e.g., learning disabilities).

Even with the massive effort following World War II, hundreds of thousands of handicapped children and youth were still systemically excluded from publicly supported educational programs. With the passage of Public Law 94-142 in 1975, free, appropriate public education within the least restrictive setting was mandated for all children regardless of their particular handicapping condition. The major impact of Public Law 94-142 has been a massive increase in educational programs for previously excluded children and youth. Of equal importance has been the creation of the Individualized Educational Program that requires that each individual student be provided educational services based upon his or her unique individual educational needs. Public Law 94-142 does not require services to be provided on the basis of categorical definitions of exceptionality. This establishes categories only for purposes of monitoring and state accountability.

Although one outcome of P.L. 94-142 has been the creation of new categories of exceptional children (e.g., severely multi-handicapped), it has also left the door open for the creation of more noncategorical service delivery models of education (c.f. Aqiulina, 1976, and Ballard and Zettel, 1977, for more detailed information concerning P.L. 94-142).

CURRENT CLASSIFICATION PRACTICES

There are currently two distinct educational service delivery systems in operation within the United States. The majority of States are educating children under the more traditional categorical educational model, while several States have adopted a service delivery model that has been termed "noncategorical." A recent survey (Belch, 1979) indicated that 11 states currently have noncategorical certification requirements for teachers of the handicapped; i.e., teachers are not designated by traditional categorical titles such as emotionally disturbed, mentally retarded, blind, and so on. These teachers do receive generic training that enables them to teach children who present problems representative of several different categorical designations. The 11 states that currently offer noncategorical teacher certification are: Connecticut, District of Columbia, Idaho, Kentucky, Massachusetts, New Hampshire, New York, Oregon, Tennessee, Texas, and Vermont. Twelve states that currently do not offer noncategorical teacher certification are reported to be heading in that direction: Alaska, Louisiana, Maine, Mississippi, Missouri, Nebraska, New Mexico, North Carolina, Rhode Island, South Carolina, Washington, and Wyoming. The remaining 27 states indicated that they currently did not offer noncategorical teacher certification nor did they intend to adopt that model.

In light of the current controversy over the categorical versus noncategorical educational model, it would seem appropriate to look more closely at the general characteristics and assumptions of each model. Within the categorical educational model, children are sifted into a variety of categories based upon their apparent major handicapping conditions. They are then assigned to classrooms with other students of the same category. The homogeneous grouping of students for instruction is deemed to be in the best interest of the children. Teachers, legislative funding patterns, and parent groups are also often organized along categorical lines. Basic assumptions of the categorical educational model include:

1. Unacceptable learning and/or behavioral problems are assumed to be surface symptoms of some presumed (in many cases)internal psychological disability;

2. A child's failure in a regular classroom is due to deficiencies within the child and not the educational system;

3. Homogeneous groupings of students are in the best interests of children. Therapy or intervention strategies are similar for all learning disabled children, for example, but are not similar for other categories of children;

4. Only teachers trained to teach children from each category have the skills necessary for educational programming.

A list of current categories for exceptional children is included in Table 1.

Table 1

Common Categories for Identifying Exceptional Children

Trainable Mentally Retarded
Educable Mentally Retarded
Severely Mentally Retarded
Communication Disorders
Autistic
Learning Disabled
Deaf-Blind
Hard of Hearing
Visually Impaired
Emotionally Disturbed
Orthopedically Handicapped
Other Health Impaired
Seriously Emotionally Disturbed
Multiply Handicapped
Socially Maladjusted
Handicapped Infant
Handicapped Preschool
Gifted/Talented
Neurologically Impaired
Brain Damaged
Speech Impaired

In recent years there has been considerable concern among educators pertaining to categorical education practices. Of major concern has been the possible detrimental effects of labeling children and segregating them from the mainstream of education by means of these labels. The "anti-labeling" movement has been a major impetus towards noncategorical education. Objections to categorical education have included the following (Gardner, 1977):

1. Special class placement isolates exceptional children from normal peers and experiences;

2. Labeling children results in stigmatizing the child that might result in loss of self-esteem and lowered acceptance by others;

3. There is little evidence to support the practice of grouping students by ability levels;

4. Mildly retarded children make as much progress in regular classrooms as in special education classrooms;

5. Special class arrangements inappropriately place the responsibility for academic failure on the child instead of the schools or teachers;

6. The existence of special classes encourages the misplacement of many children, especially minority children;

7. Diagnostic and related program placement practices may contribute to, and possibly create many of the problems they were designed to solve;

8. Once a child is labeled and segregated, it is difficult to regain his/her original status of being normal;

9. Labeling sets into action a self-fulfilling prophecy;

10. Children left in the mainstream have fewer opportunities to form desirable attitudes towards handicapped children;

11. Homogeneous grouping of students increases the possibility of learning additional inappropriate behaviors.

The noncategorical educational model was conceived as a possible alternative to the traditional categorical model in light of the above concerns. Within this system, categories are not altogether eliminated. Labels for *children* are eliminated, but labels for *educational placements* remain. For example, placements may be identified as regular class, regular class with special education support, academic special education, and basic skills special education. Children are placed along this, or a similar continuum, according to their assessed individual educational needs and not according to diagnostic labels. Within a noncategorical educational system one may find children who, under the traditional model, would be labeled as mentally retarded, deaf-blind, emotionally disturbed, or orthopedically handicapped. All of these children may be placed in the same classroom within the noncategorical system. Basic assumptions of a noncategorical educational model include the following:

1. Each student represents a unique set of learning problems and educational goals that must be met according to his/her individual needs. The homogeneous grouping of students along categorical lines is counterproductive to this ideal;

2. A child's failure in an educational program is due to the educational system and not the child;

3. Strategies for teaching children with various handicapping conditions are more similar than different. Noncategorical educational systems will be discussed in more depth in subsequent sections of this chapter.

ANALYSIS OF BEH FUNDED PROJECTS IN THE AREA OF THE SEVERELY HANDICAPPED

During the years 1975-1977, the Bureau of the Education for the Handicapped (now the U.S. Office of Special Education) issued contracts to service providers of severely handicapped children and youth based upon subcategorical differentiations within the more general category of severely handicapped. The subcategorical designations were stressed in an effort to spark the interest of service providers who previously had not taken advantage of the monies available through BEH to develop innovative educational opportunities for severely handicapped children and youth. The contracts made available to service providers were directed at the following subcategories of severely handicapped children and youth:

1. Programs for Severely/Profoundly Retarded Children Birth Through Early Childhood (RFP-76-21);

2. Programs for Severely/Profoundly Retarded Youth (RFP-76-22);

3. Programs for Severely Handicapped Children and Youth with Auditory Impairment as One of Their Primary Handicapping Conditions (RFP-75-14);

4. Programs for Severely Handicapped Children with Visual Impairment as One of Their Primary Handicapping Conditions (RFP-76-20);

5. Model Projects for Deaf Blind Children and Youth (RFP 79-35);

6. Programs for Severely Handicapped Children with Orthopedic Impairments as One of the Their Primary Handicapping Conditions (RFP-76-19);

7. Programs for Severely Handicapped Children and Youth with Emotional Disturbance as One of Their Primary Handicapping Conditions (RFP-77-11).

For the purpose of this analysis, final reports from five model projects were made available for review. The five projects addressed themselves to severely handicapped children within the following subcategories: visual impairments, auditory impairments, deaf-blind, blind, and emotional disturbance.

When reviewing the available project reports, an attempt was made to assess the validity of assigning subcategorical definitions to the severely handicapped population. More specific questions included the following:

1. Do we currently have the ability to differentiate between subcategories of severely handicapped individuals?

2. Are curriculum areas that have been identified for each categorical group markedly different?

3. Are different instructional techniques and methods of documenting progress necessary for each subcategory?

4. Are different evaluation and assessment systems necessary for each subcategory?

5. Are required educational settings different for each subcategory?

6. Are training programs for professionals interacting with students from the different subcategories markedly different?

7. Are subcategories realistic, given the low incidence of these students in any one school district or area?

The traditional categorical educational approach would imply that model demonstration efforts for the various subcategories of severely handicapped children would be more different than similar. It further implies that therapy or intervention strategies for children within the same category should be different. If the above questions are answered for the most part "yes," the same validity for subcategorical groupings may be assumed. If the above questions are answered for the most part "no," then the validity of grouping severely handicapped children into subcategories should be seriously questioned.

Question 1: Do we currently have the ability to differentiate between subcategories of severely handicapped individuals? In order to assess this question, it is necessary to first examine our present ability to differentiate severely handicapped individuals from all other handicapped persons. Federal and state governments attempt to differentiate populations of handicapped individuals through definitions that identify major physical, sensory, and behavioral characteristics of each population. The characteristics of each individual are then matched to the definition of a particular population for the purposes of classification.

The definition currently in use by the U.S. Office of Special Education (OSE) to define the population of severely handicapped individuals is not sufficient to define a discrete population of individuals. (See Table 2 for the definition of severely handicapped in use by OSE). When reviewing the current OSE definition for severely handicapped, several problems become apparent. First, this definition is of the "may be" variety: "Severely handicapped children may possess severe language and...". According to one analysis provided by Sontag, Smith, and Sailor (1977), statements in the form "may be characterized by" become necessary when a definition relies upon a set of subjective variables with which to characterize a discrete population. The "may be" statement greatly increases the probability of an error in identification of the false positive type, i.e., a child from a different population is identified as severely handicapped and is served inappropriately because he/she shows at least one of the identified characteristics within the definition.

Another potential problem with this definition is that it is directly related to services "traditionally provided" by regular and special education programs. The term "traditionally provided" assumes that services provided by regular and special education programs across the country are uniform. This assumption may be grossly in error. Traditional services provided in Lawrence, Kansas, may be very different from services traditionally provided in Burlington, Vermont, or Concord, California, or Atlanta, Georgia, or in any other region of the United States. A child who fails to progress in a traditional special education program in one district, and is thus labeled severely handicapped, may succeed in a traditional special education program in another district and not be labeled severely handicapped. Errors in identification must be expected when the attempt is made to identify a discrete population of individuals by their success or failure in educational programs

Table 2

Definitions of Severely Handicapped Children and Various Subcategories

Category	Subcategory
SEVERELY HANDICAPPED	WITH VISUAL IMPAIRMENT
"Severely Handicapped Children" are those who because of the intensity of their physical, mental or emotional problems or a combination of such problems, need educational, social, psychological and medical services beyond those which are traditionally provided by regular and special educational programs, in order to maximize their full potential for useful and meaningful participation in society and for self-fulfillment. . . . Severely handicapped children may possess severe language and/or perceptual-cognitive deprivations and evidence a number of abnormal behaviors such as: failure to respond to pronounced social stimuli, self-mutilation, self-stimulation, manifestation of intense and prolonged temper-tantrums, and the absence of rudimentary forms of verbal controls, and may also have an extremely fragile physiological condition. (45 CFR 121.2)	Whose visual impairment is one of their primary handicapping conditions.
	WITH AUDITORY IMPAIRMENT
	Whose auditory impairments is one of their primary handicapping conditions.
	WITH ORTHOPEDIC IMPAIRMENT
	Whose orthopedic impairment is one of their primary handicapping conditions.
	WITH EMOTIONAL DISTURBANCE
	Who have an emotional disturbance as a primary handicapping condition. Emotional disturbance means a condition exhibiting one or more of the following characteristics over a long period of time and to a marked degree: an inability to learn which cannot be explained by intellectual, sensory, or health factors; an inability to build or maintain satisfactory interpersonal relationships with peers and teachers, inappropriate types of behavior or feelings under normal circumstances; a general pervasive mood of unhappiness or depression; or a tendency to develop physical symptoms, pains or fears associated with personal or school problems. The term includes children who are schizophrenic or autistic. The term does not include children who are socially maladjusted but not emotionally disturbed.

Table 2 (Continued)

Category	Subcategory
SEVERELY/PROFOUNDLY RETARDED	
Same definition as severely handicapped	
DEAF-BLIND	
Children who have auditory and visual handicaps, the combination of which causes such severe communication and other developmental and educational problems that they cannot properly be accommodated in special education programs solely for the hearing handicapped child or for the visually handicapped child	

that may be vastly different in terms of the quantity and quality of services provided.

The definition of deaf-blind children is similarly deficient (Table 2). According to this definition, a child can be classified as deaf-blind (and be eligible for funding appropriated for the education of deaf-blind children) only if he/she is excluded from what could be viewed as a less restrictive educational program. This definition is also directly linked to the child's failure in traditional special education programs; i.e., children are classified as deaf-blind if "they cannot properly be accommodated in special education programs solely for the hearing handicapped child or the visually handicapped child." As with the definition of severely handicapped, the quality of the special education programs traditionally provided plays an important role in the determination of whether or not a given child will be classified deaf-blind.

The definitions of subcategories of severely handicapped individuals further complicates the problem of accurately assigning individuals to a given categorical classification. For example, the definition of severely handicapped children with emotional disturbance (Table 2) is also of the "may be" variety, with the precise wording changed to read "exhibits one or more of the following characteristics." It is interesting to note that the definition includes a disclaimer that excludes "children who are socially maladjusted but not emotionally disturbed."

In regard to the identification of persons with emotional disturbance, Kauffman (1977) stated:

> "There are currently no tests that measure personality, adjustment, anxiety, or other relevant psychological constructs precisely enough to provide a sound basis for definition of *emotional disturbance*. Reliability and validity of psychometric tests are not adequate for the purpose of dividing the disturbed from the non-disturbed ...Direct observation and measurement...have not resolved the issue...There is no consensus among teachers or psychologists regarding the frequency of a given behavior (e.g. hitting a classmate) that indicates emotional disturbance.

In light of the controversy regarding the ability to distinguish emotionally disturbed individuals from nondisturbed individuals, it would seem to be even more difficult to distinguish emotionally disturbed individuals from social maladjusted individuals.

When reviewing the definitions of categories for severely handicapped with auditory impairments and severely handicapped with visual impairments, the question of reliability and validity of diagnosis must also be raised. The determination of the extent of visual and auditory loss by standard opthamology and audiology testing procedures is not possible for the majority of persons classified as severely handicapped. Assessments tend to rely upon anctedotal information from parents and teachers. Although this type of information may be reliable in many instances, there is much room for a misdiagnosis and for the possibility of assigning the child an inappropriate label and educational program. The ensuing educational program may emphasize the use of visual and tactual training to the exclusion of auditory training since the child was labeled "deaf." In reality, the child's hearing mechanisms might be intact and he/she had not effectively "learned" to use auditory skills. In this case, the appropriate educational program would have included intensive auditory training in an effort to maximize the use of existing auditory skills that the child possessed but did not use effectively. Extreme care must be taken so that the assigning of a categorical label does not preclude appropriate programming.

The definition of severely/profoundly retarded used by OSE is exactly the same as the definition for severely handicapped. (See Table 2 for the definition of severely handicapped). In effect every child who is classified as severely handicapped can also be classified as severely/profoundly retarded (by definition). This means that a child who fits the definition for severely handicapped with emotional disturbance also fits the definition of severely/profoundly retarded. Thus, a major inconsistency exists for those who feel that retardation and emotional disturbance are different phenomena.

On the basis of definition and the current difficulties in assessment, a child could very easily be placed within any number of categories at the convenience of professionals (or available programs), and not on the basis of the actual handicapping conditions. If there is validity to the supposition that children with similar handicaps require similar treatment and education within homogeneous groups, then practices of subcategorizing within the more general category of severely handicapped would seem to be doing as much harm as good. Those children who are inaccurately categorized may not be provided appropriate programs. A more useful practice would be to develop educational programs based upon demonstrated educational needs and not categorical labels that may be based upon tenuous diagnostic information.

Question 2: Are curriculum areas that have been identified for each subcategorical group markedly different? Based upon the review of five project reports made available, it is apparent that curriculum areas addressed by each project are more similar than different. (Refer to Table 3 for a description of these projects by the population of students they reported to serve.) Four of the five projects included instruction in the areas of language/ communication, social, and self-help/behavior (the project for blind children only stresses visual stimulation within the project report). Three of the five projects identified the areas of academic skills and vocational skills. Two projects identified motor and cognitive skills and one project identified recreation skills as program areas.

Specific differences in curriculum areas reported by the various projects may be due to various factors. For example, a project servicing very young children may not include vocational or recreation skill training in the curriculum. Similarly, a project serving all ambulatory children might not include motor skill training within the curriculum. It can be assumed that at some point in the life of a handicapped individual (from birth to old age) each of the curriculum areas represented within the projects reviewed would be an appropriate area of attention, regardless of the individual's handicapping conditions. There is no evidence from the model projects reviewed that would support the supposition that a child within one subcategory of the severely handicapped population would need training in a curriculum area different from those needed by children in the other subcategorical groupings.

Question 3: Are different instructional techniques and methods of documenting student progress necessary for each subcategory? As can be observed in Table 4, all of the model projects reviewed incorporated a data-based system for documenting student progress except the project serving blind infants that did not report instructional techniques. Three of the four projects that reported instructional methods adhere to a behavioral approach. The fourth project, serving children with emotional disturbance, reported a psychoeducational approach incorporating an activity-based intervention strategy. Differences in instructional methodologies used by project personnel would seem to be due to the particular educational philosophy of the professionals in charge of each project and not due to the fact that one instructional approach was specifically designed to teach a particular subcategory of students. For example, the model project for children with emotional disturbance was not necessarily exemplary of programs designed for severely emotionally disturbed children.

The Judevine Center for Autistic Children in St. Louis, Missouri, and the Spaulding Youth Center (for emotionally disturbed and autistic children) in Tilton, New Hampshire, are examples of programs that serve children who could be classified as severely handicapped with emotional disturbances (according to the definitions in use by OSE) and adhere to a behavioral approach to education. It appears that differences in instructional techniques and measurement systems found in programs serving subcategories of severely handicapped children may be due to individual differences in the training and philosophies of the program staff and not due to the specific subcategorical designations to which students have been assigned.

Question 4: Are different evaluation and assessment systems necessary for each subcategory? Three of the five projects reviewed reported use of interdisciplinary assessments for the severely handicapped children being served (refer to Table 5). The extent of the assessment process of the three projects varies somewhat in terms of the types of professionals represented on the assessment team. The remaining two projects report a more limited assessment process. The project that serves children with emotional disturbance reported the use of case histories, parental interviews, and selected behavioral checklists. The project serving blind children reported visual screening as the only assessment provided.

Differences in the reported evaluation and assessment procedures seem to be due more to individual program variations and the particular children served by each project than to subcategorical distinctions. For example, a project serving children experiencing normal motor development probably would not include a physical therapy assessment as part of the assessment process. However, this does not preclude the fact that other children assigned the same subcategorical designation, but not served within the specific project, might evidence motor problems that would necessitate physical therapy consultation.

The assessment procedures reported by the project serving blind children seem questionable. The information gained from a visual screening process alone would seem to be totally inadequate for the development of appropriate educational intervention procedures for severely handicapped children. In order to effectively meet the educational needs of severely handicapped children and youth, evaluations should be performed by a variety of professionals prior to educational placement and periodically thereafter. Assessments in the areas of medicine, communications, physical and/or occupational therapy (in the case of physical handicaps or motor delay), hearing, vision, and education would seem to be a minimal requirement.

Question 5: Are required educational settings different for each subcategory? Table 6 shows that the educational placements described within the projects reviewed were within integrated settings, with the exception of the project for blind children. The project serving children with emotional disturbance reported integrating these children into regular education classrooms. The project serving students with auditory impairments reported a continuum of services ranging from institutional programs to integrated classrooms with nonretarded hearing and deaf students. The remaining two projects (for deaf-blind children and visually impaired children) are integrated in the sense that children from the specific subcategorical grouping that the project served were educated with severly handicapped children who could be designated by other subcategorical labels.

There is no evidence to indicate that children from specific subcategorical groups required specialized settings for their educational programs. As a matter of fact, the majority of students were being served within heterogeneous settings even though the practice of subcategorizing students would imply that homogeneous groups of students with similar labels would be desirable.

Question 6: Are personnel training programs markedly different for personnel working with students in different subcategories? Table 7 shows the personnel training requirements delineated in the five projects reviewed. It should be noted that the training topics in Table 7 do not necessarily represent comprehensive programs designed for teachers of the severely handicapped, but are specific topics identified by each project for staff and/or teachers who are already teaching the students served by the project. It should also be noted that specific content within the topics addressed was not identified in any of the reports reviewed.

While there are certain similarities among training components (e.g., measurement methods, IEP preparation, remediation strategies), there are definite differences that relate to subcategories of students. For example, the project report for deaf-blind students stressed visual and auditory assessment and specific remediation approaches. The project serving children with visal impairments included mobility training and vision training. The project serving children with emotional disturbance included specific diagnostic approaches and research and theory in autism and severe emotional disturbance. It seems that specialized training for personnel interacting with students from different subcategorical groups may be an important consideration.

Table 3

Curriculum Areas Identified in the Projects Reviewed

Project Category	Curriculum Areas Specified	Specific Curriculum
Deaf-Blind	Language, Social, Self-help Motor, Preacademic and Prevocational	Not addressed in report
Auditory Impairment	Self-Help, Interpersonal Relations, Cognitive, Language, (Pre)Vocational	Social Learning Curriculum for the Mentally Retarded (adapted for auditory impairments); Behavioral Characteristics Progression
Visual Impairment	Language, Cognition, Self-Help/Social, Motor, Vocational, Recreation	Not addressed
Blind	Visual stimulation	Not addressed
Emotionally Disturbed	Behavior, Socialization, Communication, Preacademic	Developmental Therapy

Table 4

Instructional Approaches Identified in the Projects Reviewed

Project Category	Instructional Technology
Deaf-Blind	A behavioral-remedial approach incorporating task analysis, behavior analysis techniques and direct data on programs.
Auditory Impairment	A behavioral approach incorporating behavior analysis techniques and weekly probe data on assessment objectives (BCP).
Visual Impairment	A behavior approach incorporating behavior analysis techniques and Precision Teaching data collection techniques.
Blind	Not discernible from project report.
Emotionally Disturbed	Psychoeducational approach incorporating an activity based intervention model and periodic probes on subjective rating scales and video tapes.

Table 5

Evaluation and Assessment Approaches Identified in the Projects Reviewed

Project Category	Evaluation and Assessment Methods
Deaf-Blind	Transdisciplinary Team Assessments: Social Work, Psychology, Nursing, Developmental Therapy (includes sensory-motor functioning, physical therapy, pediatric-neurological), Communication, Educational (includes assessment on various scales as the TARC, BCP, etc.
Auditory Impairment	Psychoeducational Team Assessments; Audiological, Medical, Psychology, Language, Educational (BCP, teacher rating scales).
Visual Impairment	Diagnostic Team Assessments: Psychology, Special Education and consultants when necessary. Assessments include intelligence, motor, language and social.
Blind	Visual screening is the only assessment reported.
Emotionally Disturbed	Case histories and parental interview, behavior checklists (Developmental Therapy checklist, SMAN checklist).

Table 6

Educational Settings Identified in the Projects Reviewed

Project Category	Educational Settings
Deaf-Blind	Severely multiply handicapped classrooms in the public schools.
Auditory Impairment	Integrated classrooms of hearing and deaf students Deaf education classes SMH classes for the deaf Home programs Institutional programs
Visual Impairment	Existing placements (includes institutions for the mentally retarded, school for the blind, public schools in self-contained classrooms, residential school for the emotionally disturbed).
Blind	School for the blind, special class.
Emotionally Disturbed	Integrated settings within public and private schools.

Table 7

Inservice Training Components Identified in the Project Reviewed

Project Category	Inservice Training Components Identified
Deaf-Blind	IEP preparation, remedial-behavioral instructional technology, systematic measurement and data technology, audiological assessment and specialized training approaches, visual assessment and specialized training approaches.
Auditory Impairment	Application of behavior modification principles, methods of teaching language, remediation strategies, developing IEPs, classroom management, assessment of students progress, paraprofessional training.
Visual Impairments	Developmental screening and assessment, intervention strategies, orientation and mobility, self-help vision training, impact of sensory impairments on cognitive development.
Blind	Unclear from project report
Emotionally Disturbed	Philosophy and background on integrated settings, research and theory in autism and severe emotional disturbance, working with parents, curriculum approaches, record-keeping, diagnostic approaches, music approaches, staff relationships.

Question 7: Is it realistic to subcategorize, given the low incidence of these students in any one school district or area? In actual practice, the homogeneous grouping of students is the exception rather than the rule. The number of students identified as having severe handicaps within a local school district is extremely small. It is likely that such students will be placed within a variety of educational settings such as residential programs for the mentally retarded, special classes for severely handicapped students, special classes for trainable mentally retarded students, and, in some cases, regular education classrooms with special help. Even in areas where special classrooms exist for severely retarded children, deaf-blind children, emotionally disturbed children, physically handicapped children, and so on, the range of handicapping conditions within each classroom is often extreme. This fact presents a real problem for persons supporting subcategorical educational placements for severely handicapped children.

Summary of Model Project Review

Although the sample of model demonstration project reports reviewed was small, it was representative of programs currently under development for severely handicapped children and youth. There appears to be little support within the project reports reviewed for the practice of subcategorizing severely handicapped children.

It should be pointed out that subsequent to 1977, OSE has discontinued the practice of issuing contracts based upon subcategorical differentiations within the more general category of severely handicapped. However, a substantial number of states continue to differentiate subclasses of severely handicapped individuals. This can be evidenced by the continued development of special programs for children variously labeled as autistic, deaf-blind, mentally retarded, physically handicapped, etc. Such programs should be carefully evaluated in terms of individual student needs. Programs should not continue to be developed that are based upon unfounded theoretical constructs, or tenuous assessment methods, or "tradition."

ALTERNATIVES TO CATEGORICAL SERVICE DELIVERY MODELS

A basic drawback to the traditional categorical education model was expressed by Pechter (1979) who made the following statement in reference to placement of children in special education classes:

> Funding is based on the label attached to a child. The school's incentive lies in labeling as many children as possible at minimal expense. Service delivery models reward those districts that can incorporate children with the least possible change in existing programs. Most planning, therefore, is guided by an archaic structure which still equates broad labels with rigidly defined slots for placing children. Relying on "the way we have always done it" is a simpler, safer, and programatic response for school personnel who fear the wrath of superiors. Overcoming this myopic vision to press for structural changes demands imagination, skill, and the courage to confront entrenched bureaucratic practices. Assessments designed to assure the label without indicating a need for unavailable services meet the criteria most appealing to administration. They bring in the most money for the least expense. (p.69)

Although the above quote may seem unjustly harsh, it raises an issue that must be addressed. The categorical education formula rewards educational systems for labeling children as retarded, emotionally disturbed, etc., and for displacing them from regular classroom settings into special classes.

Hobbs (1975) has raised another critical issue pertaining to the classification of children:

> "Categories and labels are powerful instruments for social regulation and control, and they are often employed for obscure, covert, or harmful purposes: to degrade people, to deny them access to opportunity, to exclude undesirables whose presence in some way offends, disturbs familiar customs, or demands extraordinary efforts." (reported in Pechter, 1979, p.71).

Whether or not one agrees or disagrees with the above statements, serious questions must be raised concerning the efficacy of the categorical services delivery model. The potentials for misuse are evident; diagnostic procedures and labeling practices are questionable; the harmful effects of labels upon students are potentially devastating; misplacement of students is a common occurrence; and the supposed benefits for the homogeneous grouping of students is unsubstantiated. The concept of educational programs based upon the specific needs of each individual student eliminates the need for categorical education systems.

The practice of assigning educational placements on the basis of categorical labels may be viewed as counterproductive to the development of an appropriate educational program. Within the categorical system, students are placed according to diagnosed handicap. Students diagnosed as emotionally disturbed are placed in special class arrangements with other students assigned the same label. Students with Standford-Binet IQ scores between 51 and 36 are assigned to classrooms for the trainable mentally retarded. It is only *after* diagnosis and placement has occurred that the student's educational needs are determined. At this point the teacher's ability to meet the student's needs is determined by the specific environment in which the student was placed. For example, a student is identified as severely emotionally disturbed and placed in a special class with other emotionally disturbed students in a special school. The teacher determines that the student needs normal peer interaction to promote appropriate social skills, but there are no appropriate peer models within the special school. Thus, the student's educational needs cannot be met.

An alternative approach would be to assess the student's educational needs, and then determine placement based upon consideration of these needs and possible environments that would best meet them. In the above example, the student's needs would be assessed and placement would include access to appropriate peer models. With this approach, the need for labeling would be minimized.

As previously stated, Sontag et al. (1977) suggested an alternative to the categorical service delivery model. Sailor and Haring (1977) made further elaborations on this model. This service delivery model could be classified as "noncategorical" since the emphasis is placed upon the educational service needs of students and *not* categorization by handicapping condition. Educational placements within the service needs model (noncategorical) are redefined into four basic components: handicapped early education (serving preschool-aged children); basic skills development (serving school-aged children in the curriculum areas of self-care, motor, communication, social, preacademic, prevocational); academic special education (serving school-aged children in the curriculum areas of communication, social, academic, vocational, community living, etc.); and career special education (serving post-school-aged individuals).

Within the service needs model, referrals to the basic skills or academic special class would be based upon the extent of educational need as determined by assessment and program plan. Students who are currently labeled deaf-blind, mentally retarded, emotionally disturbed, or orthopedically handicapped would be educated in heterogeneous placements determined solely on the basis of educational need. Depending on specific needs, students could be assigned to regular education classes with special help, academic special education classes, basic skills classes, or any combination of these classes on a full or part time basis.

As reported by Belch (1979), eleven states currently utilize noncategorical teacher certification requirements for teachers of the handicapped. Twelve additional states report to be considering such a service delivery model. The state of Vermont, for example, currently offers four basic certifications for teachers of the handicapped, in addition to three specialist credentials. Special education certifications offered are:

1. Teacher of the Handicapped: Early Essential Education;
2. Teacher of the Handicapped: Intensive Special Education Classrooms for Multi-Handicapped;
3. Teacher of the Handicapped: Special Education Class Programs/Resource Teacher Programs;
4. Teacher of the Handicapped: Diversified Occupations Programs.

Specialist credentials offered are:

1. Special Education Specialist: Speech and Language Pathologist;
2. Special Education Specialist: Consulting Teacher/Learning Specialist;
3. Special Education Administration: Coordinator of Special Education Services.

Implications for Educational Services and Programs

The advantages of a noncategorical service delivery model at the local school district level are numerous when compared to the categorical approach. These advantages are found both in relation to administrative policies and classroom education. Below are listed some of the more important advantages of a noncategorical approach to serving handicapped students in the public schools.

1. Teacher recruitment and selection systems would be vastly simplified. Administrators need worry only about recruiting four types of teachers instead of up to sixteen types (some of which are extremely hard to find).
2. Transportation needs (and costs) may be reduced. Within the categorical service delivery system, classrooms for low-incidence populations (severely retarded, autistic, orthopedically handicapped, deaf-blind, hard of hearing, etc.) are generally either dispersed throughout the school district or are located in a few central locations. Students, once labeled, must then be transported to the classrooms that are supposedly designed to meet their educational needs. Within a noncategorical system, students may attend the basic skills classroom or academic special education classroom or regular classroom that is closest to their home.

3. Fewer qualified teachers may be needed to serve the same number of children. In a hypothetical situation, a rural school district might identify three students as autistic, four students as severely mentally retarded, two students as deaf-blind, four students as severely orthopedically handicapped, and four students as trainably mentally retarded. All of the students are between the ages of six and eight years of age and demonstrate a need for basic skills training (self-care, beginning communication, motor, and social skill areas). Within the categorical system, the school district must create a special class for each of the disability areas and recruit teachers certified within these specific areas. This represents a total of five classrooms and five teachers. Within a noncategorical service delivery system, students would be placed according to instructional need (all need basic skills training). In this case, the school district may need to create only three basic skills classrooms (with a maximum of six students per class) and hire only three teachers certified in basic skills instruction.

4. Facilitating interaction between parents and teachers. Within the categorical educational system, the emphasis is placed on diagnostic labels and the perceived differences between students assigned different labels.

Teachers who teach students labeled autistic may feel that they have little in common with, and thus, no need to interact with teachers and parents of students labeled mentally retarded, deaf-blind, trainable mentally retarded, etc. Likewise parents of students labeled severely/multiply handicapped may feel that they have little in common with parents and teachers of students labeled emotionally disturbed, orthopedically handicapped, etc. As a result, many teachers (and parents) feel isolated when they lack access to other teachers (or parents) with children having similar labels.

In the case of the noncategorical system, artificial differences between students are not emphasized. Each student is viewed as uniquely different from every other student, yet all students within, for example, basic skills instruction, have similar educational needs. Parents of students who might be labeled emotionally disturbed within the traditional model may find that they have much in common with parents of children who might be assigned various other labels. The educational needs of their children are similar and these children might attend the same school, and even have the same teacher. Artificial communications barriers may dissolve when labels are eliminated, and when the emphasis is directed towards educational needs.

5. A continuum of educational services. Under the present categorical system, what happens to a student who is placed within a classroom designed for students with similar labels, and who eventually meets the exit criteria for that placement? Where is that student's next placement? The answer to this question is probably as varied as the number of school districts across the nation. One common practice is to re-label the student trainably mentally retarded or educably mentally retarded and to place the student within one of these two types of classes on the basis of IQ score. Another alternative is to develop a continuum of services for each disability area (e.g., severely emotionally disturbed, moderately emotionally disturbed, mildly emotionally disturbed, and no longer emotionally disturbed). A third possibility, also not uncommon, is to allow the student to remain in his/her original placement even though that placement is judged to be inappropriate.

> In a noncategorical system, the continuum of services is apparent: basic skills, academic special education, regular class placement with supportive services, regular class placement. There is no question as to what the next placement should be for a student reaching exit criteria from a basic skills classroom. The question becomes, which of several classrooms would best meet the student's current educational needs?

Implications for Funding Patterns

A major issue of concern when attempting to restructure educational systems is the issue of funding. The federal government provides monies for special education to each state, based upon the numbers of students identified and served within each disability category. Along with federal funds appropriated to each state, state legislatures provide varying amounts of tax dollars to be applied to the state special education budget. States then channel funds for special education to local educational programs through various formulas (depending upon the state). Within the categorical education model, the amount of funds allocated to each local program is typically determined by the number of students within each disability category. As expressed by Pechter (1979), "funding is based upon the label attached to the child (p. 69)."

Public Law 94-142 does not require services to be provided to special education students on the basis of categorical designations of exceptionality, but does establish categories for monitoring and state accountability purposes. In other words, when considering alternatives to a categorical service delivery system, it must be understood that students must be categorized by disability at the state level in order to qualify for federal dollars. However, categories are not federally mandated at the local level.

States that have adopted noncategorical service delivery models have been forced to alter their funding patterns by the very nature of the system. Students are not labeled at the local level; thus, funds to local school agencies cannot be based upon number of students within each category. The types of funding patterns adopted by these states seem to be especially supportive of appropriate services to students, while discouraging the practice of increasing special education enrollments in order to gain an increase in funds.

Hobbs (1975) cites a report by Reynolds (undated) in which the state of Minnesota moved to alleviate the problems of funding local districts in relation to the number of students identified within disability categories:

> "Before 1957, the state financial-aid system was similar to that followed in most of the nation; that is, special state financial aids were paid to local districts for every handicapped child identified by category, and placed in a separate program of some form--mostly in special education classes. The system rewarded educators for labeling children as retarded or emotionally disturbed, etc., and for displacing them from regular classroom settings into special classes.
>
> In 1957, the support in terms of child "categories" was recognized as being dysfunctional and a new plan was initiated. Instead of dispensing funds according to the labels that were attached to children, the state began to pay 2/3 of the salary costs of the personnel who were needed to serve the children with special needs. Thus, the attention was shifted from the child's handicap to the quality of the personnel or programs that fulfilled his educational needs. The communities receiving funds were able to develop more and better options to serve the children involved." (Hobbs, 1975, p. 100-101)

It is interesting to note that Minnesota is not one of the states that currently offers noncategorical teacher certification. The financial-aid model that has been developed in Minnesota, however, is one that would be workable within a noncategorical model.

The state of Vermont (a noncategorical state), for example, has adopted a similar model. Local education agencies (LEA's) pay average per-pupil costs (cost for educating one student averaged across *all* students educated within an LEA) for each special education student. In other words, the LEA pays the same amount for educating a severely handicapped student that is paid for educating a student who is enrolled in a regular class. Additional costs for educating special education students are paid for by the state of Vermont. In addition, the state of Vermont also pays 75% of the salaries of speech pathologists and consulting teachers (consulting teachers provide special support services to mildly handicapped students) and 100% of the salaries of educational specialists (educational specialists provide special support services to multihandicapped students) and the coordinators of special education services hired by LEA's.

The funding models of Minnesota and Vermont would seem to be a vast improvement over categorically-based funding plans. These models reward LEA's for developing appropriate services (in terms of needed professionals at reduced cost and special services at no cost to the LEA) and offer no incentives for increasing special education attendance roles.

Implications for Teachers Training Programs

The development of a system of services that focuses on educational needs would require a realignment of traditional teacher training programs. Teachers could no longer be trained along categorical lines (Categorical teacher training programs, like categorical service delivery models, gain credibility through stressing different disability categories). When students are viewed from an educational point of view instead of a medical or psychological point of view, differences between students representing different disability categories are minimized.

When reviewing competencies stressed in teacher training programs for children labeled mentally retarded, emotionally disturbed, orthopedically handicapped, etc., more similarities than differences are identified. For example, all special education teachers must be competent in assessment, the setting of goals and objectives, task analysis, evaluation, instructional methods, and curriculum adaptation and development. Differences exist between curriculum content and specific skills related to specific handicapping conditions. Teachers of orthopedically handicapped students must have extensive knowledge in positioning and handling techniques, normal and abnormal motor development, and some knowledge of physical therapy techniques. Teachers of students who are nonverbal must have knowledge of communication development and the teaching of augmented communication techniques (e.g., sign language and communication boards). The teacher of the multihandicapped must have all of these competencies, since multihandicapped students may exhibit various disabilities.

Movement toward a noncategorical service delivery model requires that teachers acquire a greater diversity of skills. All teachers, including regular education teachers, must acquire skills that will allow them to teach children displaying a variety of handicaps. This is not only a requirement of the noncategorical service delivery model, but a necessary requirement for providing appropriate educational programs for handicapped individuals in least restrictive settings. There is no justification of the removal of a student to a special classroom setting simply because he/she is deaf, blind, or restricted to a wheelchair.

A teacher must possess the ability to interact effectively with consultants who have greater expertise in areas where the teacher's training may be limited. Teachers must be able to interact with speech pathologists, and adaptive physical educators, to name a few professionals who may be involved in the education of handicapped students.

Teachers of the handicapped must possess competencies in at least the following areas:

1. Implementation of a teaching method that is responsive to the individual differences and needs of the student and which explicitly defines and measures student progress;

2. Understanding of normal and abnormal motor, communication, social, cognitive, and sensory development;

3. Evaluation, adaptation, and development of curricula that will generalize to curriculum areas for students with varying curricular needs.

In order to accomplish these goals, teacher trainers must broaden their perspectives, resolve their differences in educational philosophy (which are for the most part based upon artificial constructs), and attempt to work together toward the development of effective teacher training programs.

Implications for Child Advocacy Groups

Child advocacy groups, such as The National Association for Retarded Citizens, National Society for Autistic Children, United Cerebral Palsy Association, National Association for the Deaf-Blind, National Association for Children with Learning Disabilities, National Easter Seal Society for Crippled Children and Adults, and Epilepsy Foundation of America, to name a few representative groups, have played a vital role in the development of appropriate educational programs for handicapped children. As can be seen by the very titles of these organizations, advocacy groups have also developed along categorical lines. There is great concern that the effectiveness of such groups would be reduced within a noncategorical service needs model of education. These fears (although very real within the minds of parents, teachers, and other advocates) seem to be unsubstantiated. As a matter of fact, the potential exists for even greater effectiveness of advocacy groups within a service needs model. For example, basic skills classrooms and academic special education classrooms are comprised of students who demonstrated specific educational needs, regardless of handicapping condition. Students who might be labeled mentally retarded, emotionally disturbed, autistic, or orthopedically handicapped may be educated within the same basic skills or academic special education classroom. This situation provides for parents, who may hold memberships in various advocacy groups, the opportunity to interact with each other parents around issues of common interest such as the appropriate education of their children, post-school options for handicapped individuals, respite care opportunities, and so on. When issues or problems arise, the combined resources of several advocacy groups would naturally be involved in the resolution of the issue.

Within the state of Vermont for example, advocacy groups such as the Vermont Assocation for Retarded Citizens, Vermont Society for Autistic Citizens, and the Epilepsy Association of Vermont are quite strong even though Vermont follows a service needs model of education. These special interest groups have also joined together to form the Vermont Coalition for the Handicapped that is comprised of representatives of the various special interest groups. The Coalition for the Handicapped meets several times a year and functions to unite the resources of the various groups to resolve problems facing all handicapped individuals.

Implications for Changing the System

To develop a service needs model of education, several general systems changes are necessary. The state departments of education must initiate the process by changing certification standards for special education teachers. Categorical certifications would be replaced by generic certifications such as Teacher of the Handicapped: Basic Skills Instruction and Teacher of the Handicapped: Academic Special Education. Changes in certification would affect hiring practices and service delivery at the local district level, and would thus require changes in teacher training programs at the university level. Teachers currently certified and working within categorical classrooms would probably require inservice training programs to add additional competencies that would allow them to teach students with varying handicapping conditions.

Ideally, the federal government should realign federal funding patterns toward the elimination of categorical labels. Although this step is not necessary for the development of needs service delivery models at the state and local level, the federal government should take a leadership role in the development of more efficient and more appropriate service delivery models for serving handicapped citizens.

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SERVICE DELIVERY ISSUES
INTEGRATED EDUCATIONAL SYSTEMS

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ANALYSIS

By now the least restrictive environment (LRE) provision of Public Law 94-142: The Education for All Handicapped Children Act of 1975 is familiar to most educators. Section 612(5) (b) of the law requires that placement maximize the education of the handicapped child with his or her nonhandicapped peers. Specifically this section of the law requires state education agencies (SEA's) to ensure that "... to the maximum extent appropriate, handicapped children ... are educated with children who are not handicapped, and that special classes, seperate schooling, or other removal of handicapped children from the regular educational environment occurs only when the nature of severity or the handicap is such that education in regular classes with the use of supplementary aids and services cannot be achieved satisfactorily." The concern for the integration of handicapped students into services which also serve their nonhandicapped peers extends to nonacademic and extracurricular activities as well. SEA's are to ensure that handicapped students participate in recess, meals, school events and services, and extracurricular activities with those who are not handicapped, again, "to the maximum extent appropriate."

Because the LRE requirements represent a significant departure from the special education status quo, and because the law and regulations ostensibly depend heavily on individual determinations of "appropriateness," implementation of the LRE provisions has proven intensely controversial and may represent the most substantive problem in implementing P.L. 94-142. Despite concerns of ambiguity regarding how to operationalize the LRE provisions in general, there has emerged a strong (though of course not unchallenged) consensus regarding the application of LRE to the design and delivery of services for severely handicapped students. In essence, the position holds that it is de facto appropriate for all severely handicapped students to receive educational services in those educational environments that are attended by their nonhandicapped agemates and to experience interactions with nonhandicapped peers throughout the course of the school years. This position is, in effect, an interpretation of LRE as an integration imperative (Gilhool and Stutman, 1978):

> There is no cognizable reason under the statutes for handicapped-only centers, certainly not on the scale they now exist. If a child can come to a school at all, even to a self-contained class in a handicapped-only center, he can come to a self-contained class in a normal school. Any teaching technique that can be used in a self-contained class can be used in a regular school building. There are few if any legitimate teaching strategies which require the complete isolation of a child from interaction with other children, and the few such strategies that there may be apply to very few children and for very short periods of time.

Logic, ethics, legislation, litigation, research data, and demonstration efforts have all contributed to the evolution of this consensus position. The various arguments have been clearly articulated and will not be repeated here (see especially Bricker, 1978; Brown, Branston, Hamre, Nietupski, Johnson, Wilcox, and Gruenewald, 1979; Gilhool and Stutman, 1978; Hambleton and Ziegler, 1974; and USOE Response to Task Force on Deinstitutionalization of the Mentally Ill, 1979).

Discussions of LRE typically focus on the characteristics of physical placement (cf. Aloia, 1978; Kenowitz, Zweibel, and Edgar, 1978). While integration into regular attendance centers is a necessary condition, it is not sufficient for realizing least restrictive educational environments for severely handicapped students. In addition to the presence of nonhandicapped students in the same facility, other criteria seem necessary (Brown, Wilcox, Sontag, Vincent, Dodd, and Gruenewald, 1977; Wilcox, 1979):

1. Presence of nonhandicapped peers.

    This criterion, an extension of the basic integration requirement, examines the extent to which the nonhandicapped students in the educational setting are peers of the handicapped students. Peers are most often defined in terms of age equivalence. For example, the peers of a handicapped secondary-age student would be nonhandicapped secondary-age students. But the environment is restrictive if the secondary-age student's "peers" are elementary aged or preschoolers.

2. *Interaction* with nonhandicapped students in school environments.

   While the mere presence of both nonhandicapped and handicapped students in a school building is clearly a step toward educational integration, such a placement remains restrictive to the extent that there is not planned and functional interaction between the two groups. Segregation of severely handicapped into wings, floors, or pods of regular school buildings, with separate access, lunchroom, and recreational facilities, does not represent the spirit of least restrictive placement. It would seem that, at a minimum, severely handicapped students should integrate with nonhandicapped peers in hallways, lunchrooms, and playgrounds.

3. *Ratio* of handicapped to nonhandicapped

   As the ratio of handicapped to nonhandicapped students in an educational setting exceeds that of the population as a whole, placement becomes restrictive. Thus, a school should provide compelling justification for housing multiple classes of low prevalence students within the same building when the services required by these students are not so unusual as to be unavailable if classes were dispersed throughout the system. While the severely handicapped are a low-incidence group, thus making it administratively effective to cluster students for services, one must bear in mind that the ability of the student, rather than administrative convenience, is the final criterion.

4. *Equality of access* to educational facilities.

   The educational and nonacademic facilities available to severely handicapped students must be comparable to those available to their nonhandicapped peers. If nonhandicapped students normally have access to libraries, cafeterias, gymnasiums, and locker room facilities, then the same resources must be available to handicapped students. A placement in which severely handicapped students have lunch in their classroom, or do not have access to locker room facilities after physical education activities, must be considered restrictive. Similarly, a program which provides vocational training and placement for nonhandicapped secondary-age students, but not severely handicapped secondary students, is discriminatory and restrictive.

5. Normal organization of school day.

The length and organization of the school day for severely handicapped students should approximate that of non or less handicapped peers. If nonhandicapped students attend school from 8:30 a.m. to 3:00 p.m. five days a week, then so should severely handicapped students. An arrangement whereby handicapped students arrive at school late and depart early because it is convenient for social, financial, administrative, or logistical reasons is untenable. Similarly, the organization of the school day should be patterned after the system in effect for nonhandicapped students. If nonhandicapped elementary students attend class in rooms that are self-contained with one teacher providing instruction in all curriculum domains, then similar self-contained arrangements are justified for a class of severely handicapped students. However, if classrooms attended by nonhandicapped students include team teaching activities and relevant support staff (art, music, and so on), then so should services to a classroom attended by severely handicapped students. Since nonhandicapped high school students typically travel through the school building taking classes in different settings, the educational environment for severely handicapped secondary students might be considered restrictive unless it provides similar opportunities to move through the school environment.

6. Quality of educational services.

The educational placement of severely handicapped students is restrictive to the extent that educational and supportive services are not available from competent professional personnel. Programs for severely handicapped students designed and delivered by uncertified teachers or by professionals who are unfamiliar with severe handicapping conditions are restrictive no matter how well intentioned.

The consensus that integrated settings are the basic feature of LRE for the severely handicapped has recently been articulated in several public forums. A resolution passed unanimously by The Association for Severely Handicapped, a 5000-member national organization advocating quality services for severely handicapped citizens, calls for the closing of segregated schools and institutions because, by definition, they do not include the integration with the nonhandicapped community that is essential for functional programming for the severely handicapped. The U.S. Office of Education response to the cabinet-level Task Force on Deinstitutionalization of the Mentally Ill (1979) takes a position against segregated school placement of the handicapped.

> ...As with institutional programs in general, segregated educational services for the handicapped are restrictive of opportunities to learn to interact with the nonhandicapped segment of society and to develop the constellation of skills required to survive with maximum independence.
>
> It is not appropriate to debate whether there should be deinstitutionalization or the desegration of self-contained educational facilities: legislation and litigation have mandated deinstitutionalization, and demonstration projects have shown the feasibility of educational models which serve both severely handicapped students and their nonhandicapped agemates. Rather, the question is how to move most effectively from the *status quo* to the realization of more normal community-based educational, residential, and vocational services for the institutionalized handicapped citizens and those yet in the educational system. Clearly there must be significant change on a variety of levels (pp. 10-11). Integrated educational programs are important because they represent the strongest hope for institutional prevention.

The call for nonsegregated educational programs for severely handicapped students may seem revolutionary in light of a service delivery history which, as recently as 1975, frequently failed to extend even basic educational opportunities to students with severe and profound handicapping conditions. However, from other perspectives, identifying the self-contained classroom in a regular school building as the basic entitlement may actually be somewhat conservative. Today in Italy, for example, there are programs in both rural and urban areas which have assigned all handicapped children, including the severely handicapped, to regular education with requisite support services (Posternack, 1979a, 1979b).

Despite the existence of a popular and clearly articulated philosophy and operational definition of LRE as it applies to severely handicapped students, there remains a significant discrepancy between the philosophy and the status quo. According to a recent survey (Kenowitz, Zweibel, and Edgar, 1978), 70% of the students labeled moderately and severely handicapped are served in self-contained special education centers. Furthermore, fully 20% of the school districts represented in the sample indicated their intent to build additional segregated educational facilities for the mildly, moderately, and severely handicapped. The 1979 Report to Congress on the implementation of P.L. 94-142 reveals that during the 1976-77 school year 7-1/4% of the handicapped students are served in separate schools or "other educational environments" such as homes, hospitals, and institutions, while data for the 1977-78 school year show slightly over 6% served outside integrated public school settings (Progress Toward a Free, Appropriate Public Education, 1979). Taken together, these data reflect a relatively high degree of educational segregation, and are somewhat surprising, given the growing number of programs throughout the nation which demonstrate the feasibility of providing service in integrated educational settings. In light of the professional consensus and the various legal and programmatic arguments supporting it, the appropriate question is not, "Should we do it?" or "Does it work?", but rather, "How can we make it work?". Now that the basic criterion has been articulated, it is time to focus, not on further consensus, but on implementation.

APPRAISAL

The program activity of the U.S. Office of Special Education's (OSE) Special Needs Section (SNS), since its inception in 1974, is probably an accurate reflection of the history and development of the general position on LRE espoused by leaders in the field of services to severely handicapped students. The position of OSE can be monitored by examining the focus of the RFP's let by SNS, while developments in the field are reflected in both the language of the proposals submitted and the activities of the demonstrations themselves. (In the following discussion, all references are to fiscal rather than calendar years.)

Analysis of RFP Requirements

The first request for proposals focused on telecommunications projects specifically targeted for "those severely handicapped children and youth who are homebound due to restricted mobility or to other aspects of social performance or physical involvement." The RFP was to a degree a response to the status quo: at that time 10% of the severely handicapped school-age population was estimated to be homebound. The concern at that point in time was simply to initiate services or to enrich students' "general life situations" rather than to attempt a more direct systems change.

The RFP's from fiscal 1975 through 1979 rather effectively ignored the issues related to the context or location of service delivery. These years focused on the design of "comprehensive educational services" which would serve as demonstrations of general compliance with the impending requirements of P.L. 94-142. The provision for services in the least restrictive educational environment was not specifically highlighted.

The RFP's designed for fiscal 1978 contained the first direct reference to integration and to the context in which model educational services would be delivered. This position has become well known as "the criterion of ultimate functioning" (Brown, Nietupski, and Hamre-Nietupski, 1976). These RFP's directed offerors to focus on building student performances required in community settings, using age-appropriate task materials, and delivering instruction in integrated rather than isolated settings.

The RFP's for fiscal 1979 are still more explicit in their treatment of the least restrictive concept. Their very titles -- "Deinstitutionalization Models" and "Integrated Service Delivery Models" -- make clear OSE's interest in models for both the educational and community integration of severely handicapped citizens and for the systematic building of interaction with nonhandicapped society. While acknowledging that quality services have often been available in segregated settings, the intent of the procurements was to generate models for integration and provide an adequate test of the benefits of services to severely handicapped children and youth in settings with their nonhandicapped peers. The issue in these procurements was not simply the placement of severely handicapped students in self-contained classes in regular elementary, middle, or high schools but, rather, the development of a system which allowed interactions to occur regularly as a necessary component of the educational program. Those 1979 RFP's which were not explicitly focused on integration questions nonetheless embodied many requirements related to the integration imperative. Each RFP issued contained a rather unequivocal statement: "It is the purpose of this procurement to fund models which are characterized by... integration." By 1979 OSE had moved not only to make more sophisticated demands in its severely handicapped work scopes but also to request demonstrations and models to affect systems change in the direction of integrated educational services.

Description of SNS Contractors

The nature of a program's history is determined only in part by the plans it draws for itself; it is also influenced to a significant degree by those who are contracted to carry out the construction. Of the 65 projects funded by SNS since 1974, 35 have been awards to institutions of higher education (IHE's), 9 have been to LEA's or intermediate units (8 different contractors), 4 have been to SEA's, and 19 to offerors classified as "others." As one might imagine, the "others" category consists largely of private special education schools and state-operated institutions. Naturally, this last and large group of contractors really do not have the resources or the self-interest to invest in integrated educational services: private schools and institutions by definition do not have the nonhandicapped peers with whom to integrate severely handicapped students nor is it likely that they would purposefully put themselves out of business by transferring students and responsibilities to those capable of providing integrated services. While universities certainly have the capabilities for designing and delivering integrated services to severely handicapped students, actually doing so would quite probably require them to work closely with public school programs which are the source of nonhandicapped peers. While a segregated university laboratory school or demonstration classroom for severely handicapped may be an appropriate environment for basic research or technological development, it is hardly the grounds for developing integrated service models. Unfortunately, most university contractors have focused their efforts in segregated programs on the university campus or in attempts to upgrade services in existing segregated programs.

The relatively small number of contracts that have gone to LEA's or SEA's have, on the face, had perhaps the greatest potential for affecting least restrictive educational services; however, with some notable exceptions, the majority of even these projects have been segregated from regular education students and programs.

Analysis of Project Foci and Strategies

Though prior to 1978, the procurements from the SNS did not identify integration or desegregation as important characteristics of funded projects, contractors themselves not infrequently cited "deinstitutionalization," "normalization," or "mainstreaming" as program components. Twenty-five of the 65 projects make such a reference in their abstracts while others are integrated programs but fail to tout the fact or simply regard it as a necessary prerequisite to the major project goals, such as leisure skill programming.

An interesting contrast to the explicitly nonintegrated telecommunications workscope was Project MAZE, submitted by the Madison Public Schools. The stated purpose of this early (1974) project was to develop public school services. In its final year, this project completed the transition of all severely handicapped students in the district from a segregated facility to self-contained classrooms in public school settings. The evolution and demonstration of the Madison Public Schools have been one of the most compelling arguments in favor of integrated services.

Contractors under 1975 procurements included three projects located in public school settings with stated attempts to move the location of program services from private or institutional placements into the public schools (KNI, Maryland SEA, and Peabody's Model Vision Program). An equal number of projects in that cohort group, however, had explicit goals of providing educational services to unserved students within institutional programs.

Contractors in 1976 gave considerably more prominence to the least restrictive concept. Seven of the 10 funded projects included reference to public school services, integration, and related goals. One of this number, a project specifically focused on deinstitutionalization was closed in its second project year. Progress in demonstrating integrated services was perhaps most clearly visible in a project in which severely emotionally disturbed students were served in a private nongraded alternative school for regular education students (Peter Knoblock). Other achievements of this cohort group included movement of a project classroom from an institutional setting into the public schools and the "graduation" of a small group of young severely handicapped students from a segregated university program into a noncategorical public school preschool program (Carol Peterson). The remaining three projects funded in 1976 described themselves as providing institution or private school based demonstrations to a public school audience.

SNS funded 25 projects in 1977, ten of which originally stated goals related to community placement or community-based training, deinstitutionalization, or movement into public classrooms. While projects stated a philosophy of integration, they rarely conceptualized the process of achieving integrated services as an actual project component to be described and analyzed. Several projects of the 1977-funded group have achieved some modest success in achieving community placements for institutionalized students or in desegregating educational programs. A project based at

Cresson Center in Pennsylvania (Nathan Fama and Pat Kelly) placed one of 26 project students into a foster home during the first project year, and five additional students the second year. Another program originally based at the J.F.K. Center in Baltimore (Michael Bender) has been successful in relocating two project classrooms into regular elementary school. The program at Portland State University (Keith Turner and Jeanne Edwards) provides classroom training in a classroom in a university building but provides one-to-one vocational experience at sites in the community, while another project with a vocational focus (Al Lynch) is housed in a regular elementary school. Another project (Beth Stephens) found itself nearly integrated out of existence as classes in a handicapped-only school building were relocated in schools throughout the city as part of a more general court-ordered desegregation plan. A final project worthy of mention is that located at Northern Illinois University (Sharon Freagon). This project has worked closely with parents and the DeKalb public schools to integrate public school settings.

Though only a small number of projects were funded in FY 78, the proportion of those with a focus on integrated services is remarkably high (55%). One project working with deaf-blind children (Wayne Sailor and Bonnie Utley) focuses on comprehensive evaluation and training of residual sensory capacity, competency-oriented teacher training, and the placement of deaf-blind students in classrooms with severely handicapped peers who have no sensory impairments. Another project (Luanna Voeltz) focuses on normalization, not only by training leisure/ recreation skills to severely handicapped adolescents, but by doing so in settings which house classrooms for both the handicapped and their nonhandicapped peers. A project at the University of Missouri (Sandra Alper) is developing procedures for job training in community sites while, at the University of Oregon (Tom Bellamy), a curriculum for training generic vocational skills is being field tested with severely handicapped adolescents who attend class in a regular high school. Finally, the University of Wisconsin and the Madison Public Schools (Lou Brown and Lee Gruenewald) are collaborating on a project to generate functional and age-appropriate curriculum sequences and instructional procedures to train severely handicapped adolescents to interact effectively in integrated educational and community settings.

With the exception of the two Madison projects and several others focusing on deinstitutionalization, the integration component of the projects has been more incidential than intentional. Integration was a goal to be achieved but in the absence of a systematic strategy or plan. There was a general reliance on a "readiness" approach: if students were carefully assessed, and received more careful instruction, they would of course acquire the skills necessary to enter and participate effectively in integrated settings. Of course, a question that is frequently asked is, "How can you logically train for integration in a segregated environment?". Considering both the discrepancies between the two types of settings and data on performance generalization by severely handicapped learners, an approach that focuses on building student skills in isolated settings does not appear promising. A second common approach to the problem of realizing integrated environments was characterized by efforts to move students to allegedly less restrictive educational placements within segregated or institutional placements. Assignments to "halfway house" arrangements on institutional grounds or to a "higher functioning class" within a segregated school might indeed move toward participation in more normal school and community interaction, but more realistically represent another attempt at institutional reform, in one case, and place the burden on the severely handicapped child to "earn" his or her right to an integrated environment in the other. Flow-through, continuum, or cascade models appear reasonable to the outsider but rarely offer systems mobility to the student. The concept of a "continuum of services" within a segregated setting does not satisfy the consensus interpretation of LRE for severely handicapped students.

The history of SNS projects in fact reflects increasing integration. This is particularly impressive in light of the fact that until 1979, integration was not an explicit requirement, nor did the RFPs mandate functional collaboration between the contractor, providers of services to nonhandicapped, and educational service providers responsible for severely handicapped students. There is no doubt but that the existence of Bureau or other funded demonstrations of integrated educational services strongly support integration as the "bottom line" of LRE and do much to shift the burden of proof from those who would challenge the status quo to those who would support segregation.

STATUS QUO

Least restrictive educational environments for severely handicapped students are those that include opportunities for functional interaction, effective instruction from competent educational staff, and a normal organization of the school day. While these characteristics clearly exceed mere physical integration, physically integrated educational facilities are basic to realizing the LRE provision and are, in fact, appropriate for all severely handicapped students. Despite the professional consensus, there are a number of possible challenges to implementing LRE.

Legal Challenges

The potential for a legal challenge to a definition of LRE as integrated educational settings arises because the regulations themselves contain a conservative element. Section 121a. 551 calls for "... a continuum of alternative placements ... to meet the needs of handicapped children for special education and related services." This continuum is to include the alternative placements listed under the preceeding definition of special education and should provide for supplementary services "... in conjunction with regular class placement." While the regulations (121.14) define "special education" as including "... specially designed instruction ... including classroom instruction, instruction in physical education, home instruction, and instruction in hospitals and institutions," in later discussion of a continuum, however, "special education" is elaborated to include "... instruction in regular classes, *special classes*, *special schools*, home instruction, and instruction in hospitals and institutions. "Special classes and special schools" seem to have been legitimized by the stroke of a pen. It seems unfortunate, too, that supplementary services are associated only "... in conjunction with regular class placement." It would seem obvious that, just as a student should not be removed "... from the regular education environment ... (unless) the nature or severity of the handicap is such that education *in regular classes* with the use of supplementary aids and services cannot be achieved satisfactorily (italics added)," so should it be impossible to remove a student from a regular (viz. integrated) setting or building without first intervening with "supplementary aids and services." Such intervention might take several forms: modifying the performance of the *student* (providing a tutor, employing new or modified curriculum materials, utilizing prosthetic devices or adaptive equipment), modifying the interaction of the *teacher* with the target student (e.g., providing training, consultation, or some sort of "packaged" program), or modifying the entire *class structure* (through physical rearrangement, changes in schedules or instructional arrangements, or the use of group contingencies, for example). Combinations of such supplementary services would, of course, be possible. *Only after systematic and sequential intervention with the student*, *the teacher, and the class would it be appropriate to consider a change in placements*. Participation in "regular classes" should not be the only issue which activates supplementary services. Administrative procedures which required systematic behavioral documentation of the failure of supplementary services (in other words, which required one to operationalize the lack of "satisfactory" achievement) would very likely strengthen the LRE Provision.

As it stands, the regulations provide a consumer-based definition of what is an appropriate educational program. If the consumer -- the parent -- is satisfied, the program is appropriate. If the parent chooses to exercise due process procedures, the program was on its face not appropriate.

> Analysis of the meaning of the statutory imperative clarifies the respective functions of two LRE implementation devices; (1) individual by individual least restrictive environment (LRE) determinations required as a part of each individualized education plan and (2) systemwide planning, construction and assignment and application plans. At a practical matter, the first device can and often does function to assure placement in the most integrated setting among the settings available for the appropriate education of a particular individual. Individualized determination procedures should, but as a practical matter usually do not, function to change the number and kind of alternative settings which are in fact available -- whether by phasing out impermissible settings or by generating an increased number and kind of mandated integrated settings. The burden of changing what is available must be discharged by systematic planning, reporting and enforcement mechanisms. The integration mandate cannot be implemented by individualizing devices alone. It must be enforced directly upon the LEAs and SEAs by measuring and correcting the kind of settings which are available in each local and state school system, for in the absence of serious enforcement, what is available will be used. And what is available departs significantly from what must be. (Gilhool and Stutman, 1978, pp. 195-196).

It is clear that the systems change required to deliver appropriate and integrated services to severely handicapped learners necessitates a reliance on a bottom line definition of LRE, not merely the exercise of due process.

Challenges Based on Social or Emotional Considerations

In 121a.552, P.L. 94-142 directs consideration to "any potential harmful effect on the child" that might result from placement in the least restrictive educational environment. This provision is a conservative response to a variety of fears and anticipated negative effects of integration. Basically tantamount to arguments against integration, a number of these "emotional welfare" considerations will be presented below with a brief description of related research or demonstration data.

Severely handicapped students just aren't ready to move into a regular education setting. The counterpoint to this argument takes the form of a series of questions: Just how are they to get ready? How can they learn to behave more normally in an environment which is patently abnormal? How can they learn skills required to interact with nonhandicapped students while they remain in an environment that contains no handicapped students? Rather than wait until such time as the severely handicapped students are mysteriously "ready," it is more appropriate to begin training skills which they will need in the very environments where those skills will be demanded. It is the responsibility of any education program to teach pupils those skills in which they are deficient.

Demonstrations of successful moves into integrated settings provide compelling alternatives to the readiness position. LEA's that used class-by-class or transition strategies focused on a very simple aspect of environmental readiness, namely, "Is there classroom space available," rather than on student readiness. Many, indeed probably most, severely handicapped integration efforts were successfully effected with this sort of gross insensitivity to the students. As integration occurs and is planned on a larger scale, there is a tendency to provide more elaborate orientation and simulated activity for students and their parents prior to the actual move (see for example the guidelines of Hamre-Nietupski, Branston, Ford, Stoll, Gruenewald, and Brown, 1978).

Moderately and severely handicapped students would feel "different" if they had to go to school each day with nonhandicapped kids. It is better for them to be with others like themselves. Severely handicapped students indeed are different from their less handicapped or nonhandicapped age-mates: they are by definition less competent in major areas of life functioning. Continued mutual isolation of severely and nonhandicapped students from one another, however, probably does little to develop understanding or tolerance on the part of the nonhandicapped group.

While it has been repeatedly demonstrated that educators have the technology to effect dramatic changes in the repertoires of severely handicapped learners, such changes will not realize their full impact without accommodation and support from the nonhandicapped sector. For example, there must be employers who are willing to hire those severely handicapped workers who have demonstrated the competence for particular jobs; similarly, there must be landlords who will rent apartments to severely handicapped adults, thus making available more normalized living arrangements. It is unlikely that such enlightened citizens will arise from the ranks of those who have never been exposed to severely handicapped populations. Integration during the school years may build an important base of support for later efforts.

A recent study by Voeltz (1979) is interesting in this regard. She examined the attitudes of nonhandicapped students toward interaction with handicapped students and found that nonhandicapped children were more likely to express positive attitudes towards interaction as the amount of contact increased. Thus, respondents from schools which included classrooms of severely handicapped pupils were likely to be more positive than respondents from schools without such integration. This is at least tentative evidence that contact can result in positive attitudes. Whether the behavior of regular education children is consistent with their self-reported attitudes is not, of course, addressed but remains an empirical issue. It is, however, an issue that cannot be investigated in the absence of interaction opportunities. Furthermore,

> ... it would be specious to utilize data on initial social interactions between two groups of children who have never previously interacted as conclusive evidence regarding the possibilities inherent in integration efforts. What is needed is a determination on the part of the educational system to give children -- handicapped and nonhandicapped -- the opportunity and the necessary assistance to develop positive interaction patterns in integrated community and school settings. Once this opportunity is available, behavioral observations on the development and quality of longitudinal interactions should commence to collect formative evaluation data to guide professionals in the optimal design of integrated educational services. (Voeltz, 1979, p.17).

Severely handicapped students need to be protected. In an integrated setting they would be ridiculed, abused, ripped off, and assaulted by other students. This is probably the most compelling argument for the isolation of severely handicapped students from their nonhandicapped peers. However, ridicule, abuse, and assault are unfortunate facts of life and are by no means visited only upon the handicapped. Any manifestation of difference is a potential basis for ridicule, rejection, or abuse. Those who wear thick glasses, have acne, wear unusual clothing, are too short or too tall, or too fat or too thin, are all social "victims" at one time or another. It is virtually impossible to protect any given individual from every potential form of abuse. In lieu of employing segregation as a protection, time and energy might be more productively spent teaching severely handicapped students to cope with ridicule and abuse, while teaching nonhandicapped students more appropriate forms of interaction.

Hambleton and Ziegler (1974) provide what may be the only real data related to the question of whether severely handicapped students are subjected to teasing and physical aggression as a result of educational integration. As part of a systematic case study of integration in the Toronto Metropolitan Schools, they monitored both aggression and positive social initiations directed toward 25 moderately/severely handicapped students in an integrated school setting and toward a matched group of students who remained in segregated setting. Nine hours of observation during recess time revealed that (a) more positive initiations to target students occurred in the integrated setting, (b) target students were more socially responsive in the integrated setting, (c) the frequency of aggressive behavior toward target students was higher in the segregated program, and, perhaps most interesting, that in the integrated setting aggression toward target students was overwhelmingly likely to be initiated by handicapped peers.

Including both severely handicapped and nonhandicapped students in the same facility would work a hardship on both groups. The implication here is vague, but hints at compromises in the quality of services to both severely handicapped students and their nonhandicapped peers. Though it is somewhat difficult to respond to so vague a threat, one cannot help but feel that an integrated school would provide for richer and more varied educational experiences than would continued isolation of the two programs. Both groups of students would have a whole new stimulus class about which to learn. Severely handicapped students would at least have available normal, age appropriate models for nonhandicapped behavior.

Data related to this challenge might examine both academic and social "hardships' for both regular education students and for their severely handicapped peers. Existing evidence (Hambleton and Ziegler, 1974; Fink, 1979) suggests that on academic, or at least instructional objectives, severely handicapped students in segregated settings do not achieve significantly better than their counterparts in integrated programs. This finding of "no difference" at least speaks to the argument that integration would in some way damage the education of those integrated. There seems to be no data whatsoever on the impact of integration on the academic performance of regular education students. Since LRE does not imply the academic integration of severely handicapped students into regular classroom instruction, the question of detrimental effects on nonhandicapped learners is really not germaine.

Concerning the social impact of integrating severely handicapped students Hambleton and Ziegler (1974) again provide the most pertinent data. Their analyses of over 30 hours of naturalistic observation on the playground show that trainable students in the integrated sites were involved in integrated (handicapped and nonhandicapped) activities on more than 50% of the coded observations. As might be expected, the frequency of physical interactions was greater than that of verbal interaction. These data would seem to establish the simple fact that physical juxtaposition did indeed result in some level of functional interaction. Comparisons of data from matched groups of students in handicapped-only and integrated sites showed that the frequency of positive interactions was greater in the integrated setting (755 vs. 262). Analyzing the social environment's response to initiations from the handicapped students, Hambleton and Ziegler report that social overtures were ignored by peers roughly 30% more often in the segregated setting. The existence of integrated activities, the more positive character of the interactions, and the increased responsiveness of the environment combined with the absence of aggression by nonhandicapped students toward nonhandicapped peers seem to constitute strong evidence that integration is not detrimental and indeed, from both social interaction and social learning perspectives, may be preferable to segregated environments.

There have been various demonstrations that severely handicapped students can be taught interaction and other social skills (e.g., Gable, Hendrickson, and Strain, 1978; Ragland, Kerr, and Strain, 1978; Strain, Kerr, and Ragland, 1979; Wambold and Bailey, 1979; Whitman, Mercurio, and Caponigri, 1970). This technology would certainly suggest that, once housed in an integrated setting, severely handicapped students could be systematically taught specific skills and discriminations necessary to interact more frequently and effectively with their nonhandicapped peers. While general social interaction curriculum materials do exist (for example, Carney, Clobuciar, Corley, Wilcox, Bigler, Fleisher, Pany, and Turner, 1977; Hamre-Nietupski et al., 1978), certainly more investment is necessary both in the development of locally appropriate curriculum materials (especially for adults and secondary-level students) and in the design and evaluation of strategies to facilitate opportunities to handicapped-nonhandicapped interaction during the school day and over the course of the school year. Reported demonstrations of such integration (Almond, Rodgers, and Krug, 1979; Wilcox, Carney, and Fortschneider, 1978; Hamre-Nietupski, et al., 1978) can serve as the bases for such delivery plans.

It may be that both nonhandicapped and severely handicapped students do "prefer their own kind"; indeed, it would be hard to ignore the sizeable social psychology literature that identifies similiarity as the basis of interpersonal attraction. However, there is an important functional and legal point to be made: refusal by students to interact with one another is quite different than a restriction on their opportunity to do so. If handicapped students are not fully accepted by regular education students, as the literature on mildly handicapped students suggests (Gottleib, 1978), it does not necessarily follow that they are actively rejected. It becomes imperative that teachers systematically foster the attitudes, skills, and opportunities for severely handicapped and nonhandicapped students to interact if the maximum benefits of integration are to be realized. In this light it is encouraging to see some recent materials developed for regular education students to acquaint them with the impact of various handicapping conditions (especially Bookbinder, 1978; Edrington, 1978).

Integration might be okay for young severely handicapped students but not junior and senior high aged students. Older students don't have the skills to cope with the complexity of the routine, with the activities of a high school, or with social/sexual interactions that occur. Paradoxically, it is probably older students who are more in need of exposure to and contact with nonhandicapped agemates. For them, there remains precious little time in school and very real needs to learn to handle the complexities of the post-school environment.

Demonstrations of the effective integration of severely handicapped adolescents and young adults into age appropriate school buildings and into vocational experiences provides strong contrast to this challenge.

Administrative Challenges

Administrative challenges to the realization of integrated educational environments for severely handicapped students emanate both from considerations of cost and from the difficulty of overcoming bureaucratic inertia.

We can't move from this building. No other could possibly have the special accommodations necessary for the severely handicapped. Section 504 of the Rehabilitation Act requires that public buildings be accessible to handicapped citizens. Since schools are certainly public buildings, the excuse that a physical plant is inaccessible, and therefore cannot house severely handicapped students, is hardly legitimate. While Section 504 is not interpreted to require that every school building be completely barrier free, it clearly does require that sufficient numbers of buidings be accessible so as not to require the de facto segregation of handicapped students. Minimum adaptations necessary to accommodate the severely handicapped include access to the school building itself and to various areas within the school such as the playground, lunchroom, library, and toilet facilities. While all reasonable accommodations should, of course, be made, there is no need to create "perfect" environments: students must be taught to confront and manage some of the barriers they will encounter outside the educational setting.

... but the student could not do X in a regular school setting. Most often, X is taken to equal vocational or home-living stimulation activites, and so the argument becomes "we cannot move into a normalized regular school environment because the students could not participate in sheltered workshop in the cafeteria in the afternoons." Though opportunities for training in simulated settings may be a component of a vocational or domestic curriculum sequence, performance in simulated environments is not a requirement, and is certainly not itself a long-range goal for severely handicapped students. Rather than being trained to clean the bathroom in the school's home living area or to cross a mock intersection contained within the four walls of the special education center, severely handicapped students should be learning to cross real intersections (complete with traffic and other pedestrians), and should learn to make beds and clean bathrooms in their own domestic environment or as part of the on-the-job training for chambermaid or janitorial work. That there are rarely elaborate simulated settings in most schools is not a problem; their absence may actually hasten the move to train functional tasks in natural settings.

Students would not have the curriculum continuity that is inherent when all severely handicapped students are housed in the same facility. The mere congregation of classrooms of severely handicapped students in a single school or center does not automatically produce more consistent, coordinated instruction. As a student moves from teacher to teacher within the same building, she/he is likely to experience considerable discontinuity in instructional objectives and procedures. Ways to circumvent this variability include (a) developing IEP's that can be passed from teacher to teacher and (b) organizing the instructional program around a curriculum composed of longitudinal skill sequences in important performance domains. In neither of these solutions is program continuity dependent upon all severely handicapped classrooms sharing the same physical plant. When there are written records of individualized educational goals, which are task-analyzed into short-range objectives and accompanied by objective measures of student performance, or when student performance is referenced to a core sequence of critical objectives, then educational decisions are left less to the discretion of individual teachers. Written IEP's or articulated curriculum sequences supplant the need for oral history. As parents take a more active role in the educational programs that serve their severely handicapped children, they will become a major source of program continuity.

Perhaps the most serious challenge to integrated services is the alarming financial problem facing all the nation's public schools. One hears, with unfortunate but increasing frequency, of tax credits for education or of a voucher system that would allow parents "credit" at the school of their choice. This would in all likelihood produce an era of private educational corporations with a resulting loss in population to the public schools. Severely handicapped students might then face the same fate as other "beneficiaries" of the integration movement: by the time they are allowed in, everyone else has gone. Though much of the integration literature has focused on access to public schools per se (Sherr, 1976; Sontag, 1976; Wilcox, 1979), the two are independent issues.

If voucher systems come to pass, it will be important to ensure equal access by severely handicapped students to those nonpublic services. In the meantime one should be alert to the fact that declining financial commitment to the public schools in all likelihood signals declining support for special education.

The Challenge of the Adult Service System

No discussion of LRE in the educational system would be logically complete without a brief consideration of what lies ahead: the adult service system. It is important to recall that one of the most compelling arguments for integrated services during the school years was to prepare severely handicapped children and youth to participate in the complex, heterogeneous, and integrated postschool environment (Brown et al., 1976); a vision of institutional adult life would, of course, have validated a model of segregation and isolation during the school years (Hambleton and Ziegler, 1974). Despite the fact that after 18 or more years of schooling, future severely handicapped graduates should be considerably more competent than their counterparts of the pre P.L. 94-142 era, they may nonetheless not enter into the anticipated heterogeneous and integrated post-school world. Despite the fact that severely handicapped young adults may have successfully participated in integrated educational services for many years, they may not find a comparable opportunity once they leave the educational system.

At present, the funding structure of the adult services system is likely to result in the assignment of severely handicapped people to adult day programs (Bellamy, Sheehan, Horner, and Boles, in press). Despite exemplary, secondary-level programs which train moderately and severely handicapped students for community-based employment (for example, programs of Lou Brown and Lee Gruenewald; Keith Larson and Jean Edwards; and Sandra Alper) and despite demonstrations that in programs with training, supervision, and business management, severely handicapped workers can earn substantial wages in structured employment (Bellamy, 1979), the current adult services structure does not have mechanisms to support significant and sustained training or follow-up required for community-based employment or to support structured employment models that might serve as enclaves in regular industry or as part of worker-owned cooperatives. What looms ahead, on the vocational horizon at least, is a return to trivial and segregated services. The prospect of segregation in the "next environment" is hardly exciting. Clearly the contingencies of the adult service system need to be changed if one is going to take full advantage of the foundation built during the school years.

SUMMARY

Between the idea
and the reality
Between the motion
And the act
Falls the Shadow.
T. S. Elliott
The Hollow Men (1925)

A commitment to integrated educational services for severely handicapped students has significant implications for local education agencies, for colleges and universities training personnel to serve the severely handicapped, and for OSE itself. The impact at each of these levels is briefly discussed below.

Implication for LEA's

The major task of LEA's must necessarily be to design and implement plans for achieving integrated services. A number of prototypes are available. One frequently advocated strategy is to begin by integrating severely handicapped with their less handicapped and nonhandicapped peers in preschool and early education services. In terms of any type of non-referenced definitions of degree of handicap, the early childhood period is the point of maximum similiarity and minimum discrepancy between handicapped and nonhandicapped children (Vincent, Laten, and Gruenewald, 1979). Beginning with integrated programs and making every effort to keep the cohort groups integrated allows the public school system to "grow up" integrated. Despite the obvious appeal of this logic, the major problem lies in the evolutionary nature of this strategy and the more revolutionary needs of the field.

A second strategy for achieving the school-based integration of severely handicapped students is to identify their desegregation as a component of a comprehensive system desegregation effort. As many metropolitain areas confront the design of racially integrated school services, it would seem opportune to attend simultaneously to the dispersal of students in handicapped-only facilities into integrated programs as near to their home districts as possible.

A class-by-class model plan for achieving integrated services moves single classrooms of severely handicapped students into regular attendance centers as space becomes available in age-appropriate school settings. Given declining enrollments and school closings in many areas of the country, not only would there be space available but also regular opportunity to keep neighborhood schools open by the inclusion of a class or two of more severely handicapped students from an area special education center.

Perhaps the most frequently utilized integration strategy has been a two-stage model where all severely handicapped students are first brought into the public school system and their classes housed together on a floor or in a wing of a regular attendance center. Systematic social interaction is planned in that setting and classrooms are re-assigned to more age-appropriate locations within the building (early childhood near kindergarten, intermediate handicapped near fourth and fifth grade rooms, and so on). Classes whose members have no nonhandicapped age-mates (secondary-age students or preschool classes) can be moved into age-appropriate school buildings as space becomes available. Such a two-style strategy has the advantage of immediately providing a more integrated environment for all severely handicapped students but runs the risk of institutionalizing integrated but age-appropriate placements for some portion of the student group. In planning to utilize this sort of approach to realigning LRE, care must be given to planning for the move from the beginning.

A final approach to achieving integrated services might be more revolutionary in that all severely handicapped students are simultaneously moved from segregated to age-appropriate settings.

Naturally, the particular plan adopted by any district will depend on the present state of services in that district, the general level of enrollment, the availability of space in regular attendance centers as well as administrative control over that space. It is also logical to expect that the particular systems-change strategy adopted will be influenced by local efforts in developing residential alternatives to institutional placement.

While LEA's certainly have the option of abdicating systemwide planning for integration in favor of case-by-case determinations of LRE, such an approach is not efficient in achieving a logical product, generating good will, or complying with the spirit of the LRE provision.

Implications for Training Institutions

There cannot be a significant change in the service delivery system without accompanying changes in the way IHE's prepare personnel to serve in that system. The movement toward integrated services for severely handicapped students would seem to have at least several implications for personnel preparation programs.

First of all, practice and field-based experiences for teachers-in-training should take place in integrated programs. Since any integrated program will have a relatively small number of severely handicapped classrooms, this will sacrifice the administrative convenience that practicum supervisors enjoy when all trainees can be placed at a single segregated site. However, teachers-in-training should enjoy the benefits of learning professional skills in an environment that resembles the criterion environment. Training programs must work actively with LEA's and SEA's in an effort to realize LRE for severely handicapped students and model practicum experiences for university students. It is appropriate for training institutions to actively participate in the design and delivery of services in their local communities.

A second implication of integrated services for severely handicapped students is that teacher training must include the development of competencies to program systematic interaction with nonhandicapped students. Teachers in training should be required to design social interaction programs as well as to design and implement instruction in self-help, communication, and other traditional curriculum domains.

Federal-Level Implications

In order to foster integrated educational services for severely handicapped children and youth, several kinds of activity seem appropriate at the federal level. For convenience, these activities are briefly outlined under the general headings of enforcement clarification or changes of regulations and discretionary funding.

Enforcement of P.L. 94-142. Quite obviously, careful monitoring of compliance with the LRE provision of P.L. 94-142 is basic to achieving integrated educational services for the severely handicapped. Gilhool and Stutman (1978) have suggested the existence of handicapped-only facilities as the index of compliance with LRE. Other straight-forward measures of compliance would include the building of segregated handicapped-only facilities, the proportion of the handicapped students served in regular attendance centers, and the proportion of IEP's that indicate opportunities for systematic interaction with nonhandicapped age-mates. Movement toward integration would be reflected by no new buildings to serve only the handicapped, by the closing of existing segregated facilities, by a growing proportion of students served in integrated programs, and by the inclusion of specific interaction targets on student IEP's.

These data, monitored over time, would serve as an index of compliance with the intent of the law to provide services in the least restrictive educational environment.

Examinations of Regulations. There are several aspects of existing regulations that deserve scrutiny in light of the LRE provision. Service definitions which identify student groups by a nonexpectation for integration may stand as obstacles to systematic integration. At the present, the deaf-blind are identified as those "who cannot be accommodated in special programs solely for deaf or blind children (45 CFR 121 c. 37(a))" and the severely handicapped as those students who have needs for services "beyond those which are traditionally offered by ... special education programs (45 CFR 121.2)." While these definitions do not preclude the type of integration that is being advocated here, they probably do little to create the expectation of a right to systematic interaction with nonhandicapped peers.

The regulations for P.L. 94-142 state that handicapped children shall not be removed from the regular education environment except when "the nature or severity of the handicap is such that education in regular classes with the use of supplementary aids and services cannot be achieved satisfactorily (italics added) (45 CFR 121a.550)." While the implication of this statement is clear for the mildly handicapped student, it is not so for the more severely handicapped. In light of a commitment to LRE, it would seem appropriate that "supplementary aids and services" be available not only when removal from the regular class is at issue but also whenever a change to a more socially or educationally restrictive program is being considered. Thus, prior to moving a student from a classroom for the mildly handicapped to one for the moderately handicapped or from a classroom for the "trainable retarded" to one for the severely handicapped, additional efforts and resources should be applied in the current placement and their impact evaluated. Supplementary services can take many forms (individual tutors, modified instructional materials, teacher inservice, group contingencies, etc.) and should be available prior to any change in program.

A final topic for consideration is the relationship between P.L. 89-313 (State-Operated Program for Handicapped Children) and P.L. 94-142. Passed in 1965, P.L. 89-313 provides funds for handicapped students served in state-operated programs (such as institutions, state schools for the blind, deaf, and so on). While the regulations for P.L. 89-313 do authorize the transfer of these funds to an LEA if the student is placed into a local program, transfer for the first year is at the option of the state program and dependent upon application from the receiving LEA. The financial contingencies may actually support continued segregated placement rather than movement into LEA services.

At any rate, the significant changes in both educational legislation and litigation and state of the art educational technology since 1965, underscore the need to re-examine the deployment of P.L. 89-313 funds.

Discretionary Funding. If progress in realizing integrated educational environments for severely handicapped students is to continue, the discretionary funds of OSE remain critical. Continued funding of demonstrations and model integrated services are certainly necessary. Additional investments might include the funding of materials development necessary to support integration (such as "social-studies" materials for nonhandicapped students, administrative manuals of integration strategies, handicapped-nonhandicapped interaction curricula), and the undertaking of a comprehensive evaluation of the impact of integration on both severely handicapped students and the entire service system.

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MODEL DEVELOPMENT STRATEGIES TO IMPROVE EDUCATIONAL SERVICES FOR SEVERELY HANDICAPPED PEOPLE

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The federal investment in education of severely handicapped students "had better pay dividends," cautioned Meyen (1979), no doubt summarizing accurately both public and professional sentiment. An important aspect of the investment has been the projects for severely handicapped children and youth funded by the U.S Office of Special Education (formerly the Bureau of Education for the Handicapped). Like demonstration and model programs for other student groups, these projects have been broadly designed to develop innovative educational practices in a service setting and then to disseminate information about both the practices and their effects. This chapter examines the general model demonstration strategy as a means of federal investment in improvement of educational services.

Early investment dividends are impressive: significant progress has been made in applying a wide variety of intervention procedures to the vast array of problems faced by educators of severely handicapped students. Improvements have been made in the design of teaching and behavior change procedures, environmental restructuring and prostheses, classroom organization and management, strategies for dealing with multiple presenting problems, and conceptual foundations for service delivery. While this broad progress appears to support the strategy of investing in innovative practices, the diversity among projects raises several definitional issues. For example, "innovative practices" have ranged from simple behavior change techniques to comprehensive classroom operating procedures; "development" of an innovation appears to have been interpreted to mean almost everything from eloquent theoretical justifications to careful field testing of standardized procedures; and "dissemination" has encompassed such varied activities as program visitations, newsletters, journal articles, and systematic replication of total programs.

While such diversity may have been critical in producing initial progress, it would appear to limit the focus and, ultimately, the effectiveness of federal funding. Therefore, this chapter advocates more precise specification of development and dissemination activities. Specifically, the chapter addresses the relationship between levels of development of innovative practices and purposes for which dissemination should be attempted. As a result of this analysis, it is argued that innovative practices in education and behavioral intervention be classified into three levels which correspond to three broad dissemination objectives. The chapter proposes labels, definitions, and criteria for each of the three levels of development. The resulting conceptual framework is then used to evaluate current successes and suggest new directions in the model projects for severely handicapped students that are funded by the U.S. Office of Special Education (OSE).

RELATIONSHIP BETWEEN DEVELOPMENT AND DISSEMINATION

The relationship between development and dissemination is essentially a logical one. Before dissemination is begun, development activities should ensure that the practice being disseminated meets criteria relevant to the purpose of dissemination. It is useful to distinguish three broad dissemination purposes:

1. To share information that particular procedures can result in behavior change. For example, an article about the technique might be published in the professional literature with the expectation that the reader will adapt or incorporate the procedure into whatever behavior change effort he or she is conducting.

2. To generate support for a new approach or program. A new solution to a social problem may be communicated widely to parents, professionals, legislators, and the community at large to increase support for and acceptance of the new procedure.

3. To assist a service agency in adopting and implementing an innovative practice. In this case, technical assistance may be given to service providers to enable them to use the new program in the manner intended by the developers.

To justify dissemination for each of these purposes, an innovative practice should meet several criteria during the course of development. Those differences in criteria underly the distinction in this paper between three levels of development of innovative practices: techniques are those practices that meet criteria for the first listed dissemination purpose; demonstrations meet criteria for the second; and models meet the criteria for the third. Figure 1 provides a schematic overview of the relationship between dissemination purposes, criteria, and levels of development. As is apparent in the figure, criteria for innovative practices are cumulative. The development of a practice from technique to demonstration to model is a sequential process that involves meeting criteria at each level; meeting these criteria justifies additional dissemination activities.

The distinction between techniques, demonstrations, and models is further illustrated in Table 1, where the three levels of development are contrasted along several dimensions that are critical to innovative practices. Important differences relate to the process of developing innovations (including issues such as the dependent and independent variables, research questions addressed, and the criteria for development) and the process and purposes of disseminating innovations (for example, the audience for dissemination, methods used, and intended impact on audience members). The following sections describe these differences and elaborate the process of developing and disseminating innovative practices at each level.

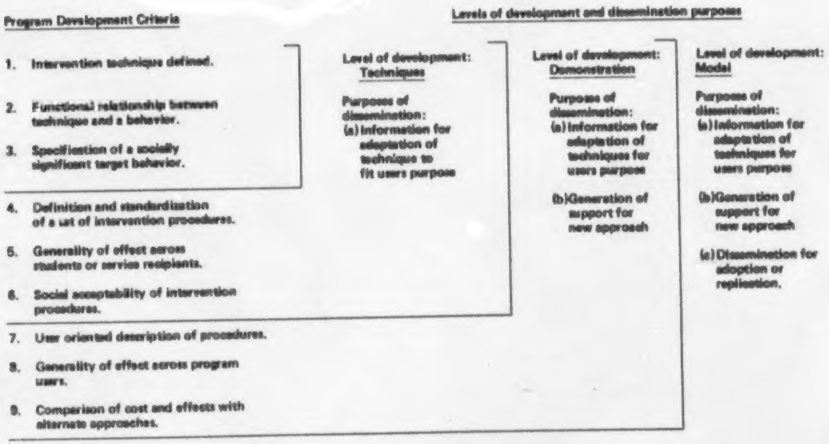
TECHNIQUES

From an educational perspective, techniques can be defined as procedures, materials, rules, teacher activities, or other environmental changes that are used in an attempt to change the behavior of one or more students. Examples of techniques currently used in services to severely handicapped students include discrete operations such as praise, prompting, shaping, and ignoring; more complex procedures like time-out, overcorrection, and token economies; and a variety of prosthetic aids.

Since many of these techniques represent applications of behavioral theory, it is useful to distinguish between techniques and behavior principles. Behavior principles refer to lawful relationships between behaviors and classes of environmental events. Understanding of these relationships is developed and refined through a process called the experimental analysis of behavior. Considered together, these principles form what is known as behavior theory. Behavior principles may be studied and perhaps understood, but not directly applied. It is from behavior principles, however, that techniques may be derived and generally applied to the intervention needs of people in natural settings. As a result, these derivations are often referred to as intervention or treatment techniques.

Figure 1

Relationship Between Program Development Criteria, Dissemination Purposes, and Levels of Development



Program Development Criteria

1. Intervention technique defined.
2. Functional relationship between technique and a behavior.
3. Specification of a socially significant target behavior.
4. Definition and standardization of a set of intervention procedures.
5. Generality of effect across students or service recipients.
6. Social acceptability of intervention procedures.
7. User oriented description of procedures.
8. Generality of effect across program users.
9. Comparison of cost and effects with alternate approaches.

Levels of development and dissemination purposes

Level of development: Techniques

Purposes of dissemination:
(a) Information for adaptation of technique to fit users purpose

Level of development: Demonstration

Purposes of dissemination:
(a) Information for adaptation of techniques for users purpose
(b) Generation of support for new approach

Level of development: Model

Purposes of dissemination:
(a) Information for adaptation of techniques for users purpose
(b) Generation of support for new approach
(c) Dissemination for adoption or replication.

Table 1

Comparison of Techniques, Demonstrations, and Models on Critical Dimensions of Innovative Practices

Phase	Level Dimension	Techniques	Demonstrations	Models
	Process of Development	Applied behavior analysis (method-oriented research)	Program development and programmatic research (problem-oriented research)	Field testing (method and problem-oriented)
	Dependent Variable	Any important behavior	Socially significant behavior problem and result	Socially significant behavior problem and result
	Independent Variable	Procedures, materials, etc., designed to change someone's behavior	Treatment of program designed to solve a behavioral problem for several service recipients	Treatment program designed for use by non-developers
	Research Objective	Identify functional relationships	Show generality across service recipients	Show generality across program users
	Objective	Tell how	Tell about	Tell how
	Target Audience	Professionals, service providers	General public	Service providers and purchasers
	Illustrative Dissemination Process	Journal articles	Media; program visits	Manuals
	Intended Audience Impact	Adapt procedures to own objectives and use	Support the new program	Adapt the program
	Responsibility for Audience success	Audience respunsible	Audience responsible	Responsibility shared by audience and developers

Dissemination Purpose

Techniques are disseminated in order to document to others that behavior change is possible using the particular procedures. This dissemination should contribute to ongoing development of procedural information and provide a potential use of the technique with enough information to apply it in a new behavior change context. An important feature of techniques is that, after dissemination, the purposes for which they are used and the details of application are left to the discretion of the user, rather than specified by the developer. As a result, techniques are described as "value free" (Bandura, 1969).

Criteria

Before the dissemination purposes can be served, three criteria should be met. First, the technique should be described sufficiently well that it can be applied by others in different contexts. Baer, Wolf, and Risley (1968) suggest a similar criterion of technological clarity. By "technological," Baer et al. mean a description which "...a typically trained reader could replicate...well enough to produce the same results given only a reading of the description (p. 95)." Second, the behavioral effect of the intervention should be socially significant in the context of application. If the technique applied does not produce an effect which is large enough to make a difference in the learner's level of functioning, it should not be recommended to others. Finally, there should be a convincing demonstration of a functional relationship between the technique and the behavior to which it was applied. To be convincing, the relationship must be supported by a visually apparent (Parsonson and Baer, 1978) or statistically significant (Kazdin, 1977) association between the technique and behavior. Two to four replications of the technique and its effect are needed to satisfy the requirements of single subject designs from which a functional relationship may be inferred (Hersen and Barlow, 1976).

Development

The process of developing techniques is now well known as the applied analysis of behavior. The critical dimensions of an applied analysis of behavior have been described clearly by Baer, Wolf, and Risley (1968), and this section draws extensively from their review. Briefly, the process is designed (a) to improve a dependent variable (behavior) that has been judged to occur too seldom or too often (Azrin, 1977; Wolf, 1978); and (b) to do so while determining the control exerted by the independent variable (intervention technique) used (Baer, Wolf, and Risley, 1968; Deitz, 1978).

Dependent variables. The dependent variable in the development of a technique can be any behavior that has social significance for the user or the recipient of service. This social significance is the index which Baer et al. (1968) refer to as the "applied" dimension in applied behavior analysis. To meet this criterion, a behavior must be significant in some natural context or meaningful to the person to whose behavior the technique is applied.

Independent variable. The independent variable in development of techniques is always a single intervention or treatment procedure. This might be a discrete procedure with a single functional element or a somewhat more complex method with two or more functional parts, like overcorrection or a token economy. Basic to the development of techniques is clear procedural specification. When techniques are disseminated, this precise description of their application or implementation provides information about the relationship between the procedure and behavior changes. It is not necessarily a guide for implementation by the user, since the purpose and conditions of use may vary. The use of techniques is not uniform from one instance to another, but rather the rules or contingencies by which a technique is applied are specified by each user.

In addition to the criterion of clear description, independent variables (techniques) should be comparable with established concepts in the field. That is, the language used to describe them should be consistent from one developer to another. This facilitates expansion of knowledge about the technique and enables broad participation in its development. Baer et al. (1968) labeled this the "conceptual" criterion, suggesting that a shared conceptual framework facilitates the development of knowledge about a technique or procedure.

Research questions. One primary question that should be asked about intervention techniques before dissemination is whether the technique is functionally related to a change in the behavior to which it is applied. This question essentially asks if the technique results in a dependable effect on the target behavior. If a technique results in a given effect just once, little is known about the relationship between the technique and the behavior. If the same effect can be obtained a second time with the same two variables, evidence begins to accrue for the argument that application of the technique produced the effect. If the effect can be obtained a third time, a consensus begins to build that the variables are functionally related, i.e., that alteration of one affects the other (Risley and Wolf, 1973). Subsequent replications that are procedurally similar strengthen this consensus while those that alter one or more details extend it (Hersen and Barlow, 1976; Sidman, 1960).

Dissemination Process

Since any technique may be applied to behaviors other than those studied by its developers, the audience for dissemination efforts crosses traditional boundaries that segregate service delivery efforts. The process of disseminating techniques usually focuses on the developer's professional peers and/or on service providers who may find the procedure useful.

Dissemination to professional peers usually takes place through publications and presentations. The mechanisms of this process include writing journal articles, chapters, or books and presenting research at professional meetings. The implied action for the members of this target audience is to pick up on a line of research, extend it further, or incorporate it into their teaching or research.

A second target audience for dissemination of techniques is the population of professional and paraprofessional service providers. These groups include directors, teachers, aides, specialists, group home staff, workshop staff, and other staff in programs for severely handicapped persons. These people usually are reached through service journals, inservice training, or popular books related to working with handicapped persons. The general purpose of such dissemination is to provide ideas about ways to deal with certain behaviors of students or client groups. The specific applications of the educational techniques are left to the service providers themselves.

DEMONSTRATIONS

A demonstration illustrates that a significant social problem can be solved in a particular way, and points out one successful method of solution. A demonstration is a collection of intervention techniques and administrative arrangements that result in important behavioral changes across individuals who typically receive a particular kind of service. Demonstrations are exemplars of a desired service delivery format, rather than isolated behavior changes, and are intended to communicate about the success of that service to a wide consumer audience.

Dissemination Purpose

Demonstration programs are disseminated for two broad purposes. First, the intervention techniques included in the demonstration may themselves be disseminated to communicate that a given technique works and is available for use. The second purpose, not shared with techniques, is to show that a particular service objective can be achieved with a given method. Dissemination for this second reason generally is undertaken to change the expectations or attitudes of persons who are in a position to use an intervention program or to enable its use; to obtain increased funding for services for a target group; to change laws regarding services; to develop political or popular support for services; and/or to develop new types of programs or services to address unmet or inadequately met needs of a given group of persons. The purpose is to show that the problem can be solved by means of the intervention program that is being disseminated.

In contrast to techniques, demonstrations are not value free. A demonstration specifies a behavioral outcome, judges the outcome to be a desirable result of services across individuals, and illustrates a method of obtaining it. An element of dissemination efforts, therefore, is an attempt to persuade others to make a similar value judgment. An example with particular relevance to this chapter is the repeated illustration in model projects that severely handicapped students can master a variety of educational tasks when clearly defined goals, direct instruction, frequent measurement, and regularly scheduled teaching sessions are used. Communication about these models has no doubt contributed both to the consensus that such educational progress is desirable, and to the development of legislative and public support for providing such services.

Criteria for Dissemination

To effect the above purposes, demonstration programs should meet several criteria prior to beginning dissemination activities. In addition to the criteria specified for techniques, demonstrations should embody the following characteristics:

1. The behavioral effect achieved by the demonstration program should be important to society. Since demonstrations imply successful service across individuals with a given problem, the solution provided by the demonstration should be perceived as desirable both by the recipients of service (as is the case with techniques) and by those individuals who enable the intervention program to be used.

2. *The set of intervention procedures that comprise the demonstration must be described and standardized*. Without clear description and standardization of use across service recipients, evidence of the utility of the proposed approach is limited to defense of specific techniques with specific individuals.

3. *The demonstration program must produce the same effects with each of several participants*. In other words, the intervention program must work consistently when implemented by developers. This is a question of program effectiveness. There must be a *replicable* functional relationship between implementation of the intervention program and subjects' improvement.

Development

The process by which demonstrations are developed is programmatic research and development (Risley, Clark, and Cataldo, 1976; Walker, Hops, and Greenwood, 1976). In this process, a line of research is followed from documentation that a problem exists, through documentation that an effective intervention has been assembled, to demonstration that the problem can be solved across individuals. Important features of demonstration programs are discussed here as they relate to dependent variables, independent variables, and research questions studied in the development process.

Dependent variables. In contrast to the development of techniques where any of a variety of socially significant behaviors might be studied, the development of demonstrations requires clear focus on a specific behavioral problem or outcome. Azrin (1977) describes this difference by distinguishing between "problem-oriented" and "method-oriented" research, suggesting that the solution to human problems in applied settings is more likely with procedures that reflect a "problem orientation." Azrin (1977) cautions that a focus on experimental rigor, which he calls a "method orientation," might produce clean research, but is less likely to leave subjects and others satisfied as consumers than is the outcome focus of the "problem-oriented" method.

It is also critical that the behaviors established as goals in demonstration programs represent socially acceptable outcomes. This issue is described in the literature as one of social validation, and has emerged in recent years as an important issue in evaluating intervention programs (Kazdin, 1977; Wolf, 1978). Basically, social validation refers to the practice of using the subjective judgments of significant others in the subject's natural environment to validate the effects of an intervention procedure. If objective data suggest subject improvement following intervention, but parents, teachers, subjects themselves, or others do not believe that such improvement has taken place, then the intervention cannot be judged to be completely successful. If, on the other hand, subjective ratings corroborate empirical data, support for the intervention is strong, and it can be recommended to others.

The focus on social importance of behavior outcomes in demonstration programs raises the issue of the broader effects of an intervention: does the improvement transfer across settings and/or behaviors and maintain across time? This question seems obvious but is seldom asked of demonstration programs. However, the question should be posed before a particular intervention program is offered as a means of solving socially significant problems. Behavioral improvement which is not evident across settings or does not persist across time can hardly be considered to be a "cure," which Azrin (1977) describes as the critical test of a demonstration. A review of the available literature (Stokes and Baer, 1977) seems to support the admonitions of Baer, Wolk, and Risley (1968) that "generalization should be programmed deliberately rather than expected or lamented (p. 96) " when it does not occur naturally. Thus, it appears that those intervention programs which are successful in achieving "cures" of the problems they attack will have to address the issues of generalization and maintenance directly.

Independent variables. The independent variable in the development of demonstration programs is a collection of treatment procedures designed specifically to change the behavior under study. As such, it is distinguished from techniques, which are individual procedures. Three general strategies appear relevant to the selection of techniques that are to be included in demonstrations. First, techniques might be included because they increase the effectiveness or efficiency with which the behavioral outcome is achieved. For example, procedures might be combined to weaken inappropriate responding while strengthening the desired behaviors. Alternately, the demonstration might include treatment components to shape a target behavior and other elements to maintain it.

The second strategy for combining procedures in demonstration programs is to incorporate techniques that increase the likelihood of success with a range of individuals. Thus, a demonstration program might encourage the use of a variety of reinforcing events, perform task analyses of target behaviors at a level of detail which would allow individuals of various levels to progress through the program, or include treatments for a variety of specific problems that are likely to occur with the target behavior.

Finally, procedures often are included in demonstration programs to assist in the administration of the intervention program. These include techniques for: (a) publicly posting staff responsibilities (Cataldo and Russo, 1978); (b) increasing the probability of supervisor acknowledgement of program results (Risley and Favell, 1979); and (c) use of consultants to monitor program effectiveness on a regular basis (Herbert-Jackson, O'Brien, Porterfield, and Risley, 1977).

Whatever techniques are included in the demonstration, their use should be standardized across recipients of service. Standardization of procedures is important to ensure that each time the program is applied, it is used in virtually the same way. This, in turn, is important since judgments about the effectiveness of a demonstration can be made only when the procedures used with one individual match those used with others. The purpose of developing any demonstration should be to provide a reliably effective means for meeting specified service needs--one which can be counted on to accomplish certain results. To maximize the likelihood that each use of the procedures will produce the same results, and to establish the dependability of the service, standardization is essential.

The combination of techniques applied in a demonstration program should also represent a socially acceptable method of solving the targeted problem. Increasingly, legal and social constraints on the use of behavioral techniques limit the options available to service providers. Kazdin (1977) and Wolf (1978) apply the concept of social validity not only to the results of treatment programs, as described above, but also to the methods used to achieve those results. To be effective, demonstrations must rely on techniques that are considered by society at large as appropriate for solving the problem addressed.

A final characteristic of the independent variable (collection of intervention techniques) in development of demonstrations relates to level of scale. It is useful to distinguish between treatment demonstrations and program demonstrations to illustrate the potential variety and scope. Treatment demonstrations deal with discrete skill areas such as toileting (Foxx and Azrin, 1973), language (Guess, Sailor, and Baer, 1976), or social behaviors (Hops, Fleishman, Guild, Paine, Walker, and

Greenwood, 1978), and focus only on the way in which a specific treatment strategy is structured, delivered, and evaluated. Program demonstrations provide a broader scope of services which usually focuses on a given setting, target populations, and service dimension rather than on a discrete skill area. Examples include the public school services for severely handicapped individuals in Madison, Wisconsin; the Specialized Training Program's vocational service for severely handicapped adults (Bellamy, Horner, and Inman, 1979); and the University of Washington's Down's Syndrome Program Model for preschool handicapped children (Hayden and Haring, 1979). These demonstrations share one common element: they are all comprehensive service delivery systems which include both direct service and program support components. In this sense they are complete programs which account for all of the factors necessary in providing the targeted services to those who need them.

Research questions. The process of developing a demonstration involves asking at least two questions about the relationship between these dependent and independent variables. The first is analogous to that asked of techniques: Does the intervention program reliably and functionally change the behavior of concern? This is the purely experimental question. The criteria for answering it are the same as those for answering it when techniques are evaluated: the relationship must be functional, the demonstration of that relationship must be convincing, and replications must be sufficient in number.

The second research question relates directly to the criteria for disseminating demonstrations described earlier: Does the program or treatment work with all or most of the individuals who display the targeted problem? The issue here is one of generality of effect across potential recipients of the service. A variety of group designs are useful in answering this question, as is careful documentation of results with a series of representative subjects.

Dissemination Process

The process of disseminating demonstration programs generally involves brief exposure to the program through the media, through the popular press, through visits by members of the target audience to a program site, through personal contact (mail, telephone, face-to-face interactions) or, among the professional ranks, through publications and/or conference presentations. The target audiences for these dissemination processes include subgroups that are widely divergent but share the goal of improving services for a specific target population.

They include potential service recipients, parents, other advocates of the service, service providers, trainers of service providers, representatives of government agencies concerned with the problems of handicapped people, politicians, professional peers (other researchers or service directors), and others. Obviously, certain of the dissemination processes are most appropriate with given subgroups. For example, media dissemination is likely to be useful in reaching large numbers of non-professional contacts; site visits and personal contacts hold the most potential when attempting to reach advocacy groups, service directors, governmental agents, or politicians; and professional publications or presentations are most appropriate when attempting to reach other researchers or program developers.

These processes of dissemination suggest various courses of action for the respective audience members to whom they are directed. For service recipients, their parents, and their other supporters, the action called for is advocacy for increased services or for general service improvements; for fellow professionals (developers) the action implied by dissemination is to conduct research that will provide further extension (i.e., systematic replication) or additional validation of the program; for politicians to whom demonstration information is disseminated, the desired response is passage of enabling legislation or appropriations measures which enable application of the program on a larger scale; for government agencies, the implied action is granting of additional research and development funds to continue development, evaluation, and dissemination of the program.

MODELS

A program model illustrates that a significant social problem can be solved in a particular way, and provides a prototype or pattern for replication in other settings where similar services could be provided. Models are similar to demonstrations in that they are designed to achieve defined behavioral outcomes and involve standardized combinations of techniques and procedures. They differ from demonstrations in the additional criteria which should be met before proposing adoption by others. Prior to dissemination, the use of a model should be supported by field test data showing that the model can be used successfully in nonexperimental settings by individuals other than the developers (Meyen, 1979). This requires, in turn, that models include precise instructions for use that are designed to maximize the fidelity and the effectiveness of replication.

The importance of model programs lies in the potential for dissemination and utilization of service strategies of known cost and effectiveness. Models could reduce redundant local investment in program development, shorten the time between resource allocation and delivery of services, and reduce current expenses for ineffective services.

Purpose of Dissemination

In addition to the dissemination activities which are possible for techniques and demonstrations, model programs may be disseminated for the purpose of adoption or replication in other service agencies. The primary purpose of dissemination activities at the adoption level is to increase the level of program usage by nondevelopers, i.e., to gain adoptions and subsequent implementations of the standardized program by potential users. As such, dissemination of service models is like that carried out for commercial curriculum materials. The difference is that there are few methodological requirements for the latter.

Dissemination for adoption is the critical step in increasing services and service efficiency. It is assumed that this step follows dissemination undertaken to spread information about a program. The focus on adoption/implementation in this step features instruction regarding how to use the program.

Criteria for Dissemination

Since the levels of program development and use are cumulative or sequential in nature, the criteria relating to dissemination for demonstration purposes apply to dissemination for adoption purposes as well. In addition, at least three other criteria unique to adoption purposes must be applied:

1. A highly detailed, user-oriented description of all procedures in the model should be available to enable high fidelity implementation. This description will likely take the form of a program implementation manual which includes checklists and other techniques of facilitate installation of program components.

2. Nondevelopers (potential consumers) must be able to implement the program successfully in a controlled context when assisted by program developers. This criterion is crucial since dissemination efforts are designed to secure implementation by others.

3. Effects and costs of using the program must compare favorably with those of other programs or other approaches to the same problem. This is a comparative research issue. Only those programs which compare favorably with the alternatives are likely to be considered seriously by potential users.

Development of Models

The process of model development begins with a successful demonstration of service effectiveness and involves the *packaging* of procedures for potential users and *field testing* by non-developers in locations other than that in which the model was developed.

Dependent variables. The primary dependent variable in model development is the same as for demonstrations: a problem behavior that is viewed as important enough by society to commit resources to its solution. Other dependent measures of interest during field testing relate to the effectiveness of alternative approaches in solving the problem and the cost of the proposed solution.

Independent variables. The independent variables of concern in model development include those described for demonstrations and additional variables related to standardization of procedures. To achieve standardized implementation of the model by others, careful packaging usually is required. Packages are collections of standardized procedures that include detailed written descriptions, instructions, checklists, and other printed aids and that often feature supplementary media components such as slides, filmstrips, films, videotapes, audiotapes, or any other methods of relaying information to achieve uniformity in implementation. Usually such packages are supplemented with workshop training, technical assistance consultation, or other forms of support for using technologies in the manner in which they were designed. The extent to which such materials lead to accurate implementation of procedures is of critical concern in model development.

As is the case with demonstrations, it is useful to distinguish between at least two levels of scale: intervention models and program models. The scope of intervention models is narrow compared to that of program models. Intervention models might include several components, all of which relate *directly* to the targeted behavior, rather than any service support functions. Generally, an intervention program is designed to be used by line staff with direct service responsibilities to students or clients; and it is usually designed to meet only one of their responsibilities with service recipients. For example, Foxx and Azrin's (1973) rapid toilet training program and the Telepac booklets for teaching practical skills (Hofmeister, Gallery, Hofmeister, Atkinson, and Henderson, 1977) are examples of standardized intervention models that are based on behavioral procedures, contain several components, are designed for use by direct service staff, and focus on one specific behavior (e.g., toileting) or a set of closely related responses within a specific skill area.

In contrast, program models typically specify not only specific intervention procedures, but also the array of administrative and support services required to deliver them effectively. For example, in the Specialized Training Program Model for employment of severely handicapped adults (Bellamy and Horner, 1976), procedures are included for program supervision, staff training, and agency accounting, in addition to the vocational training and supervision procedures that directly affect service recipients. Similar breadth is apparent in the teaching family model for serving adolescent delinquents (Phillips, Phillips, Fixen, and Wolf, 1972), and the Teaching Research data-based classroom model (Fredericks et al., 1975). Such program models provide therapeutic procedures for service recipients and administrative procedures for service providers.

Research questions. Two primary research questions should be asked as an effective demonstration is developed into a model:

1. Can the intervention program be used effectively by potential consumers in a natural or field setting? This is the critical question addressed in field testing. Once a program has been judged successful as implemented by the developers in a controlled setting, it must be shown to work when implemented by nondevelopers in an actual service setting. At this stage of research, the developers might lend technical assistance to the consumers in implementing the program, depending on the type of field test being conducted and on the type of packaging used to disseminate the program. If the program is designed to be used without technical assistance during ultimate routine use, then the field test conditions should match the eventual use conditions.

2. *Do the relative costs and effects when the model program is implemented by others compare favorably with alternative approaches to solving the problem?* Adoption of model programs by generic service delivery agencies normally will be affected by the ability of these agencies to implement the necessary procedures and achieve better results with existing resources. Thus, the program must not only be effective, it must also be cost efficient, and this efficiency must be documented and replicable if local or state funding agencies are to consider its adoption seriously.

Dissemination Process

Dissemination of model programs and interventions is aimed primarily at deliverers of service (program administrators or boards of directors) who can adopt or implement the model. It is also necessary to establish a method for expanding the model further and for promoting program survival with available resources (Meyen, 1979). One mechanism to do this, which is seldom used but which has the potential for greater impact, is to link the model with the existing state-level bureaucracy for service delivery programs (Thomas, 1979; Timbers, Seligson, Maloney, and Maloney, unpublished manuscript). Usually, dissemination is done directly by the program developers, but sometimes it is done by an intermediary service broker such as a state facilitator within the National Diffusion Network (NDN), or by a specially trained technical assistant. The processes by which standardized programs are disseminated to providers generally include implementation manuals, pre-implementation training workshops, and ongoing technical consultation. Implementation manuals differ from other dissemination materials in that they are technical in nature and are written in sufficient detail to allow adopters to replicate program procedures and obtain outcomes comparable to those achieved by developers. In short, they are precise "how-to-do-it" guides which contain many features such as sample forms, checklists, and criteria to facilitate high-fidelity program implementation. Training workshops often build on the skills presented in the implementation manuals and videotape and role playing formats are frequently used to demonstrate program procedures and to give training participants feedback on their use of the skills. Ongoing technical assistance might take the form of periodic consulting visits by program developers or their representatives to the implementing agency, with occasional program evaluations followed by feedback. Telephone and/or mail contact is usually provided on a needs basis. The actions implied for service providers by these dissemination activities are adoption, implementation, and institutionalization of the program within a service delivery agency.

A distinction is necessary between those users who *adopt* the model and implement the procedures as specified by the developers and those who *adapt* the model, treating it as a demonstration and choosing to use only some of the procedures as they, the users, see fit. Clearly, a model program that meets the criteria described earlier can be disseminated for either purpose. However, the data supporting the effectiveness of the model should be used only to justify full implementation or adoption.

In full implementation, both the purpose for which the model is used and the details of use are specified by the developer. The user is expected to determine if the model fits the problem with which he/she is faced, and involves procedures which he/she can implement. If so, the model should be used as described. If details of use cannot be specified sufficiently to allow an implementation which conforms to the developer's intent, then the program is not yet sufficiently standardized or technological (Baer, Wolf, and Risley, 1968). If the program is not used as specified, the probability of achieving successful outcomes can only be surmised. Partial implementation or use of procedures which are divergent from those specified by the developers do not directly represent the standardized program and should not be represented as if they do. They might be components or variations of the model, but they are not the model. They might even work, but that will not be known until they are tried and replicated. Generally, program users are seldom in a position to evaluate program components or variations. To maximize the likelihood of achieving successful outcomes, program users should implement the program as it is described by the developers.

Special Issues in Model Implementation

The emergence of model interventions and model programs is a relatively recent phenomenon in educational and behavioral services. Even more recent is serious inquiry into the process of model adoption and implementation. This section reports the results of a survey of 20 developers of model programs to identify dissemination methods and implementation problems in standardized intervention programs. (These data were originally presented by the first author as part of a symposium entitled

"Issues in the Dissemination of Standardized Intervention Programs" at the Fifth Annual Convention of the Association for Behavior Analysis, Dearborn, Michigan, June, 1979.)

Survey. The survey was structured to provide (a) descriptive information about each program, (b) program replication and survival data, (c) lists of dissemination strategies and quality control procedures used, and (d) a list of problems encountered in achieving program adoptions and high-fidelity implementation by potential users.

Respondents. Survey respondents were identified through the published literature on their programs, through reference materials supplied by the Office of Education's Joint Dissemination Review Panel (JDRP), and through a referral process in which respondents were asked to identify program developers whose names were not on initial mailing lists. The number of developers sampled was necessarily small because the number of projects nationwide that meet the criteria for standardized intervention programs is small. Of the 20 developers sampled, 17 responded to the questionnaire, a return rate of 85%.

Results

Program characteristics. Of the 17 programs from which data were obtained, 10 were designed for use in school settings, 5 were intended for home or other residential settings, and 2 were work-related. The largest group of persons for whom programs had been developed are elementary school students, with four programs each directed toward their academic and their socially appropriate behavior. Counting across target populations, four programs also have been developed for intervening with children in multiple skill areas, such as the development of cognitive, social language, and self-help abilities.

Replication and survival data. Thirteen of the 17 developers responding to the survey provided replication and survival data. Three were unable to do so because of the form in which their programs were made available to potential users--completely packaged with no developer involvement in adoption decisions or implementation efforts--and one reported no replications. For the 13 programs contributing such data, the adjusted mean number of full program replications achieved to date was 22.3 (standard deviation = 21.2; range = 4-175; median = 17.5).

The mean survival index for these programs was 89.1% (standard deviation - 12.2%; range - 60-100%; median - 93.0%). On the average, 89.1% of all replications achieved by these models were still in operation at the time of the survey. For the replication projects which had been terminated, the mean duration of survival was 30.2 months or just over 2-1/2 years (standard deviation - 17.4 months; range - 12-54 months; median - 26.5 months). This translates to an average discontinuation rate of one project every 27.1 months of the model's existence. Of the developers responding to the survey, 92.4% reported that they had observed "program drift" (gradual deterioration in the quality of program implementation) among one or more of their surviving projects and had to work to contain (preferably to reverse) it. Only 70.6% of the survey respondents reported that they continued to monitor a site's program implementation following initial adoption. Given the seeming tendency of programs to drift away from standardized models, continued monitoring, as well as ongoing technical and moral support would seem to be important determinants of program survival.

Dissemination strategy data. From a list of program dissemination strategies provided, survey participants were asked to designate those which they had used and, based on their experience, to rate the effectiveness of each. Not surprisingly, the practices of using demonstration and training centers and of providing long-term training (more than one week) in program procedures were rated most effective in getting standardized programs into the field. Also not surprisingly, these practices were among the least frequently used, perhaps because of costs and other logistical problems. Short-term training, training films and videotapes, professional publications, and conference presentations were among the most frequently used dissemination strategies, but were all rated somewhat less effective than "live" and/or intensive training procedures. Somewhat surprisingly, professional publications were rated as least useful of the strategies presented, and commercial publication, with its marketing capability, was used least often. Other strategies added by respondents included recruitment of potential program users and influential others by program developers.

Quality control strategy data. The survey required participants to check and rate the usefulness of each program quality control strategy they had used from a list of several such practices. Long-term training, used by nearly three-fourths of the participants as a quality control mechanism, was uniformly rated as highly effective (x rating = 5.0, s.d. = 0, on a 5-point scale). Staff consultants, short-term training, and data management services were the most frequently relied upon quality control procedures with use being reported by 16 of the 17 survey respondents. All strategies on this list received mean ratings of moderately to highly effective, a finding suggesting that, after a replication is underway, almost any reasonable continued involvement by the developers will be helpful in maintaining high program quality. Strategies added to the list by respondents included payments to replication personnel for implementing program procedures with high fidelity, providing regular feedback to implementation staff, and holding regular meetings of persons with key replication responsibilities.

Implementation problem data. From a list of potential problems in program use, developers were asked to designate the three problems which had been the most troublesome to them in implementing their programs with adopting agencies. The problem which clearly was the most serious to developers was the lack of sufficient funding to implement programs with maximum care and precision. Policies of the user agency and of related regulatory agencies were rated second and third. The problem which was cited most often by developers was regulating program use by line staff -- assuring fidelity of treatment at the point of interface between the program and the target population, a most basic issue in the implementation of standardized intervention programs. Other problems identified by respondents included lack of strong administrative support, lack of desire on the part of users to achieve behavior change, and limited time to bring staff to criterion on critical procedures.

APPRAISAL AND RECOMMENDATIONS

The distinction among techniques, demonstrations, and models and the particular dissemination purposes served by each provides a useful framework for analyzing innovative practices in the education of severely handicapped students. This section examines the effects of the OSE investment in innovative practices and suggests priorities for future efforts.

Advancements in *techniques* have been the most consistent contribution of the projects for severely handicapped children and youth. As a result of project efforts, new or improved procedures are now available in such areas as: assessment and remediation of skill deficits with deaf-blind students; vocational preparation of secondary students; sequencing objectives for infant intervention; analysis of pupil progress through behavioral measurement and graphing; and providing functional alternatives to reading skills.

Strategies for disseminating these and other techniques have been equally creative. Rapid informal distribution of ideas and products has been accomplished through encouragement of staff training in the projects and similar inservice efforts elsewhere; distribution of working papers and monographs by technique developers; a variety of training efforts conducted for others within innovative programs; creation of a new professional journal (*AAESPH Review*); and coordination between model projects and many personnel preparation programs.

The projects for severely handicapped children and youth have also been successful in developing *demonstrations*. Demonstrations of effective educational services to severely handicapped people have provided a foundation for a major shift in professional values that education, not custodial care, is appropriate for this population. At a more detailed level, demonstrations have successfully argued for educational objectives that are logically related to anticipated adult environments (Brown, Nietupski, and Hamre-Nietupski, 1976) and that educational services can be effectively provided in integrated settings (Wilcox and Sailor, 1980). Dissemination activities have included extensive access to developers of demonstration programs, and emphasis on communication about successful projects through newsletters and other media. The success of these efforts is evidenced by both philosophical commitment and resource allocations from Congress, the courts, and countless local education agencies. The development and dissemination of demonstration programs serving severely handicapped individuals have now contributed to circumstances where educational services are mandated for all severely handicapped individuals, and resources to accomplish this mandate are increasingly available.

Precisely because of these successes, the purposes which dissemination efforts should now begin to serve can no longer be met through the development of techniques and demonstrations alone. In commenting on similar issues in a different service area, Laski (1979) suggests that although demonstrations of service success could provide the logical basis for a legal mandate to extend services, these demonstrations do not provide needed information for organization and systematic delivery of quality services on a broad scale. Such is the problem now facing program developers concerned with the needs of severely handicapped persons. The objective of dissemination efforts should no longer be only to communicate about techniques and to argue for program support. Rather, significant attention should now be turned to the development and dissemination of program and intervention models in order to increase the quality and reliability of educational services nationwide. The standardized and replicable strategies produced by models fit current needs in at least three important ways, as Hayden and Haring (1978) have suggested:

1. Models increase the availability of service programs with demonstrated effectiveness, thus enabling more efficient use of limited resources.

2. Models provide an alternative to services that are poor, weak, or of unknown effect.

3. Models enable dispersed service programs to avoid continual rediscovery of effective procedures.

Because intervention techniques and public commitment are now widely available to support educational services to severely handicapped students, attention now should be turned to the improvement of quality in these programs. This implies a shift in emphasis of the projects for severely handicapped children and youth from demonstrations to models. Such a shift implies that the federal investment should now be placed in different kinds of activities. Examples of needed funding efforts are:

1. Providing support to allow currently successful demonstrations to become models. Demonstrations would use the funding to develop user-oriented procedural descriptions

and to conduct field tests in dispersed sites. This field test activity could replace or occur simultaneously with current dissemination efforts that are based on success by the developers.

2. Developing a mechanism for ongoing support to programs that have adopted a model (Emrick and Peterson, 1978) in order to provide quality control and program evaluation.

3. Establishing a federally-sponsored technical assistance consortium specifically to support model development and implementation activities in services for severely handicapped people. Such a group could be composed of individuals with model development experience and could meet such needs as: (a) assisting both local service programs and model developers in identifying model adoption possibilities; (b) assisting demonstration programs to prepare materials for and conduct field tests necessary for model development; (c) conducting third party evaluations of model development and model implementation efforts; (d) developing evaluation technologies for assessing likelihood of successful model adoption, fidelity of model implementation, and model effectiveness; and (d) providing technical assistance to service agencies in the implementation of model programs.

4. Providing incentives to personnel preparation programs to include training in available program models. Students could learn how to fill various roles within a model, including directing program replications or further dissemination of the model.

SUMMARY

A common language is needed to describe important differences among innovative practices in education of severely handicapped students. This chapter proposes use of the labels techniques, demonstrations, and models to refer to sequential levels of development of innovative practices and to designate appropriateness of dissemination for designated purposes. Techniques are materials, rules, teacher activities, or other environmental changes that have been used successfully to change some behavior important to either the developer or recipient of service. Techniques are disseminated to communicate information about a potentially useful procedure, with both the purpose and details of use left to the user. Demonstrations are illustrations that a socially significant problem can be reliably solved when the developers apply a defined collection of techniques. Demonstrations are disseminated to gain support for the service and its results. Models are standardized programs that can be utilized by individuals other than the developers to solve a specified, socially important problem. Models are disseminated for adoption or implementation by others in order to improve the quality of services.

Innovative programs for severely handicapped individuals have been incredibly successful in developing and disseminating techniques and demonstrations, and these activities should continue. However, changing needs of the field to provide effective services on a larger scale suggest that educational researchers and federal investors should begin to turn their attention to developing and disseminating program models as well.

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